Early proactive palliative care in general practice

identification, communication, and structured planning

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Printing: Gildeprint Drukkerijen, Enschede, the Netherlands
Graphic design: Nicolet Pennekamp

ISBN/EAN: 978-90-9029818-4

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Proefschrift

ter verkrijging van de graad van doctor
aan de Radboud Universiteit Nijmegen
op gezag van de rector magnificus,
volgens besluit van het college van decanen
in het openbaar te verdedigen op vrijdag 16 september 2016
om 14.30 uur precies

door

Bregje Anne Thoonsen
geboren op 24 september 1972
te Nijmegen

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Als je weet dat je dood gaat kun je twee fouten maken: doen alsof er niets aan de hand is of doen alsof het leven al voorbij is.

Rene Gude

General practitioners prized palliative care as one of the few remaining 'old fashioned' aspects of primary care, as much an art as science, based on relationships, and something that should not be at risk of reduction to a checklist or form.

Kirsty Boyd
Br J Gen Pract. 2010 Dec;60(581):e449-58

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1 General introduction

Until 2010, palliative care was mainly restricted to terminal, reactive care, and to patients with cancer. The GP, being the most appropriate professional to coordinate palliative care for home-dwelling patients, needed tools to be able to identify his palliative patients early in time, and asked for training in proactive palliative care planning. My thesis contains several studies, aiming to meet these needs.

Mr Roos 80 years old, known for years with congestive heart failure (CHF), visits the department of cardiology every 2 weeks to get rid of the overload of fluid. Ten years ago he got an implantable cardioverter defibrillator (ICD). He has big faith in the cardiologist and the nurses of the department. Together with his wife he lives in a semidetached house with a big garden. In the past year, he visited his general practitioner (GP) twice: once because he suffers from little pains in his hands and once because of some spots on his skin. (This case illustrates throughout the introduction different aspects of a palliative care trajectory for patient and his family.)

THE DEFINITION OF PALLIATIVE CARE

In this thesis the definition of the World Health Organisation (WHO) is used. In 2002, the WHO launched an adapted definition of palliative care: an approach that improves the quality of life of patients and their families facing the problems associated with life-threatening illness, through the prevention and relief of suffering by means of early identification and impeccable assessment and treatment of pain and other problems, physical, psychosocial and spiritual.[1] The WHO is not explicit what 'early identification' means, and gives no guidelines for how such multidimensional, anticipatory care can be provided. This thesis tries to find answers for these challenges.

PALLIATIVE CARE IN A HISTORICAL CONTEXT

During the crusades (1096-1272), sick pilgrims and citizens received care in hospices (xenodochia) and houses. These hospices and houses disappeared later on as a result of the development of modern medicine and the fact that hospitals came into being.[2]

'Modern' palliative care started with the body of thoughts and work of Cicely Saunders, as a reaction on the curative focus of medicine. In the sixties of the previous century, she founded the first 'modern' hospice in England, a place where holistic care of the terminal patient was provided, where also the family felt welcome, and where the patient could die peacefully.[3] In the next decades, several other hospices were founded, not only in Great Britain, but also in the United States and Australia. It took some more time before hospices were built in other European countries.

For the first time in 1973, the term 'palliatieve zorg' was used in Dutch medical literature, as a translation of 'palliative care', this was introduced in the same year by the Canadian

physician Balfour Mount.[4,5] Mount was inspired by Cicely Saunders and Elisabeth Keble Ross. In 1969, Elisabeth Keble Ross, an American psychiatrist, published a book titled 'On death and dying'. In this book, with the subtitle 'what the dying have to teach doctors, nurses, clergy, and their own families', for the first time structural attention was given to the emotions of terminal patients and their families.[6]

PALLIATIVE CARE IN THE NETHERLANDS

Until 1988, care for the dying was provided by GPs, nursing home physicians, or by the medical specialist. In the Netherlands palliative care is not a different specialty; every physician, also including the GP, is expected to provide this care.[7] Following other countries, in 1988 the first hospice, 'bijna-thuis-huis Nieuwkoop' was founded.[5] At that time, cooperation and information transfer between primary and secondary care was not organised in a structured way, and 24/7 accessibility of general practitioners was not guaranteed. These gaps in continuity of care, in combination with a lack of knowledge and skills regarding end-of-life care of GPs contributed to a growing criticism on as well the content as the organisation of palliative care. With this growing dissatisfaction the first specialistic palliative care teams were established in hospitals, as well as consultation teams in primary care.[8] The latter provide 24/7 telephone advice and support about palliative care aspects to professional caregivers. As these consultation teams were initiated by and belonged to the comprehensive cancer centres (IKNL), they historically were cancer-oriented and mainly demand-driven. They advice GPs who seek help when they were confronted with problems in the terminal stage of life of their patients with cancer.[9]

The role of GPs in palliative care provision

Palliative care is an essential aspect of the care provided by GPs. GPs are generalists, have an important role in the continuity of care, are context-oriented and demand-driven.[10] Almost each inhabitant of the Netherlands is registered on the patient list of a specific GP; this GP is responsible of the generalistic care of the patient. By having this role, the GP theoretically knows what health issues the patient has as well as the patient's context. By this central position in the health care system and the above mentioned characteristics, the GP is the professional who coordinates and provides palliative care for home-dwelling patients.[11-14]

As diagnosis of incurability of a life-limiting disease usually takes place in the hospital, the medical specialist might be the appropriate physician to define a patient as palliative. However, also medical specialists experience barriers to adapt the focus from curative to a palliative intent.[12,15] For this reason, in combination with suboptimal information transfer, GPs lose touch with these patients. To facilitate GPs in catching sight of these patients again and in taking responsibility again, tools might be helpful.

Epidemiology in general practice

Around the period I started my PhD-trajectory, the standard practice size was about 2350 patients per full time equivalent GP.[16] In 2006, yearly mortality in the Netherlands was about 135,000 of which 77,000 people (57%) died of a malignant or (other) chronic disease. This means, that in a norm general practice per year a mean of 11 patients dies non-acutely and in theory could be considered to be palliative patients in their final phase of life.[17,18] This number is expected to further increase in the next decades as a result of the aging population and longer life expectancy.[19]

In the Netherlands, 75% of the population prefers to die at home, but 31% actually does,[20] which is relatively high in comparison to other countries.[21]

Do not harm

The Hippocratic Oath is an oath historically taken by physicians. Although it is inaccurate that *'Primum non nocere'* (First do no harm) is part of it, it does state that a physician will take care of the sick, will do no harm, will promote health, and will relieve suffering.[22,23] Of course, this also concerns GPs. *'Primum non nocere'* is an important starting point of general practice,[10] which also can be explained as protecting against unnecessary treatments. Examples of this are waiting for the natural cause of a self-limiting disease or discontinuation of or deciding not to start investigations or treatment with a curative intent in case of an inevitable lethal disease. A prerequisite to meet this core value is consensus between GP, patient and his family regarding the disease and its consequences. To reach this, the GP needs to timely recognise and realise that solely curative treatment will have no positive effects anymore. At that moment, 'relief of suffering', as part of the Hippocratic oath, is the primary goal of care: palliative care.

Challenges GPs meet in providing palliative care

GPs consider palliative care a fascinating and important aspect of their profession, but also consider early identification of those patients that might profit of palliative care as well as their own coordinating role a challenge.[14,24,25] In 2009, the Dutch College of General Practitioners (NHG) published their point of view on palliative care, called 'Huisarts en palliatieve zorg, fijn dat u er bent dokter' ('General practitioner and palliative care, nice that you are here doctor'), aiming to contribute to the quality and further professionalisation of the care for the dying and their family.[26] In this point of view, several recommendations regarding palliative care planning, continuity of care and GP training are provided.

The most recent Dutch GP competences profile of 2009 contains some attention for palliative and terminal care.[27] Every GP is supposed to have some knowledge and experience in palliative care, and knows the bio psychosocial model. Knowledge and experience varies

between GPs, as it is also related to experience with and interest in palliative care. Factors that contribute to experience are the length of time of practicing as a GP, and the age division of patients in the practice. GPs stated to be unsure about their competences in palliative care.[24] If they come across specific problems when providing palliative care, they can ask for advice by phone from a consultation team, or from a GP who has had a specialised training in palliative care. About 1% of all practicing GPs in the Netherlands has completed such a specialised training.[28]

With respect to the continuity of GP care, a lot has changed in the past decades. Until the 70s, a GP almost always worked in a single-handed practice; in that period only 2% worked in a group practice. Thirty years later, in 2005, 42% of the GPs worked in a group practice.[29] As a solution for the high 24/7 availability burden, another large organisational change in general practice started: out-of-hours GP cooperative.[30] This development challenged 24/7 continuity of palliative care within practices.

Reactive versus anticipatory care

GPs mainly work demand-driven: a patient asks for a consultation because he has a symptom, problem or question, and the GP has the knowledge and skills to provide an answer. However, already in 1970 van den Dool introduced anticipatory health care: by monitoring of a population at risk, some chronic diseases can be detected in an early stage. This type of anticipatory care was introduced as part of the daily practice of GPs,[31,32] but forty years later anticipatory care in patients who suffer from an advanced or end-stage chronic, life-limiting disease still hardly takes place. In order to be able to provide anticipatory palliative care the GP needs identification of those patients in need of it, to have insight in the possible future scenarios, and knowledge how to discuss these with the patient.
In summary, the challenges that GPs face in providing palliative care are mainly experienced in early identification of palliative care patients and an anticipatory approach of care.

At home Mr Roos still enjoys his garden although he cannot maintain it as he would like. The grass is growing everywhere. His son builds him a little green house where he can stand up straight. Years ago, before his heart attack, he arranged it all by himself. But as years went by he suffers more and more from his dyspnoea. Sometimes he is scared to choke and to leave his wife and children behind without saying goodbye.

IDENTIFICATION OF THE PALLIATIVE PATIENTS

The WHO definition of palliative care states that early identification of the patient in need for it can improve the quality of palliative care.[1] Such early identification might not only contribute to relieving existing problems, but also to anticipating on possible future problems, needs and wishes of the patient. Yet, despite the worldwide acceptance of this aspect of the

WHO definition, early identification was a first challenge, as no scientifically sound tools or guidelines existed to facilitate it.[33] Although quite some studies about prognostication of mortality, survival or prognosis of patients with cancer or a chronic, life-limiting disease had been published, they don't provide an answer to the question which patients are in need of palliative care:[34-41] The latter is more related to having lost resilience, or having an increased risk to deteriorate or die.

Palliative care models

In line with the WHO definition, Lynn and Adamson developed a new palliative care model, as an alternative for the, at that moment current model in which a clear boundary in time existed between curative and palliative care.[42] In the new model palliative care needs already exists simultaneously with curative care. (Figure 1)

However, this alternative model is a simplification; it does not take account of the different disease trajectories.[43] (Figure 2)

Figure 1 - The Older "Transition" Model of Care Versus a "Trajectory" Model.[42]

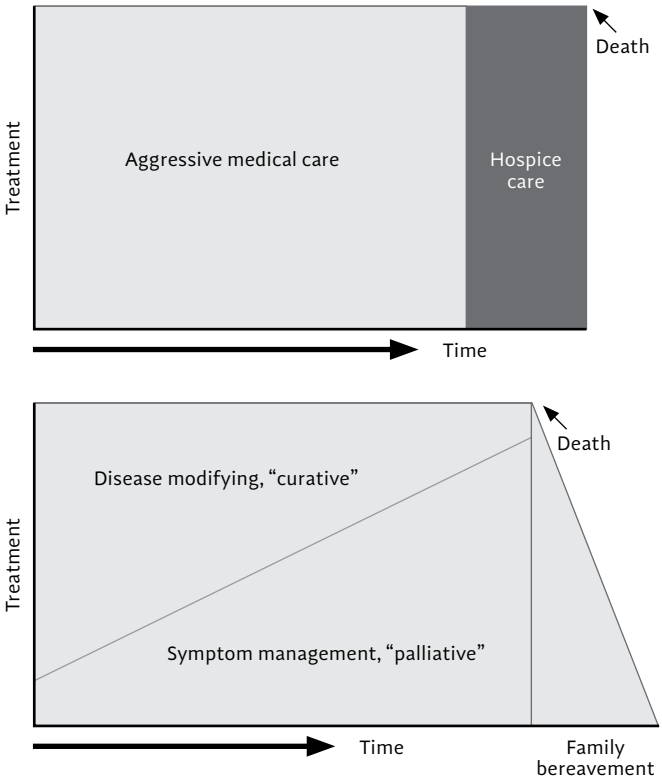
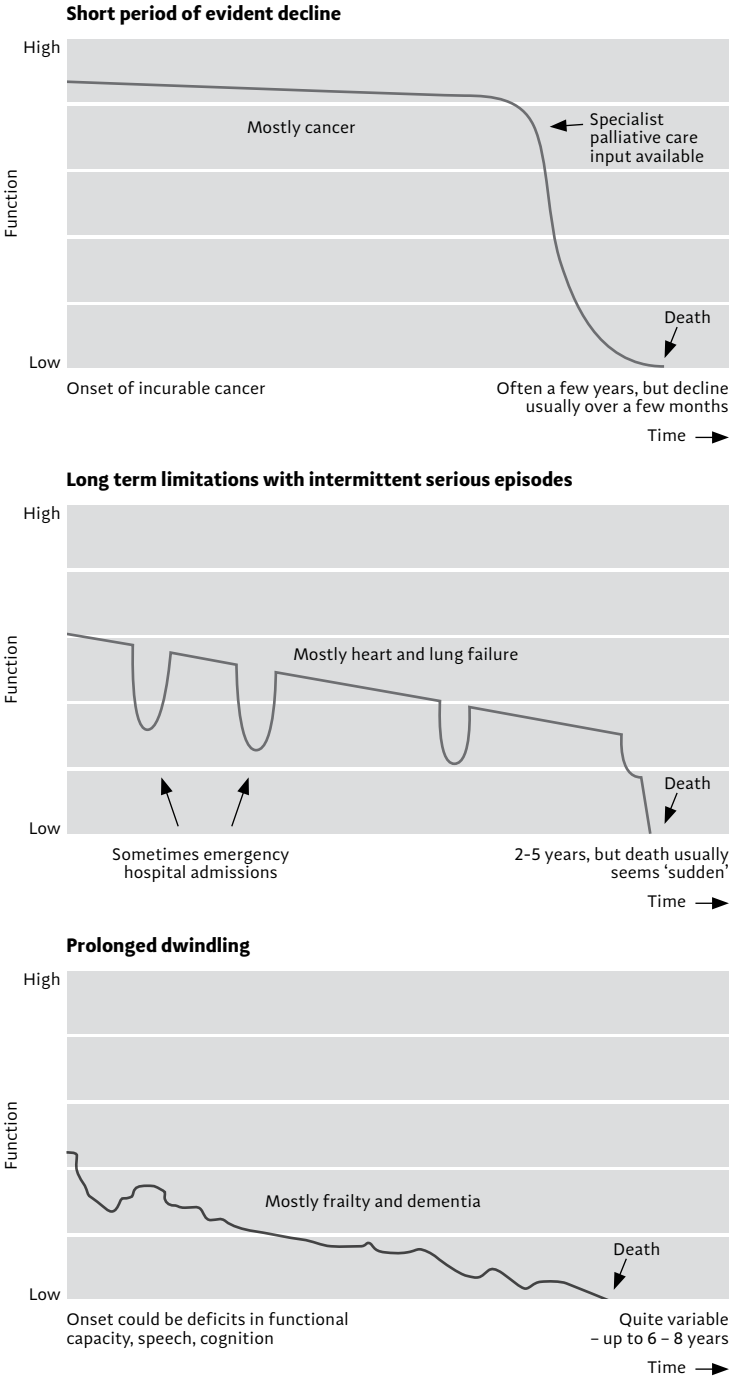


Figure 2 - Trajectories of late-life illness[62]



Three main trajectories can be distinguished:

1. Patients with cancer often start with a longer quite stable period, and after this a relatively fast decline until death.
2. Patients with chronic organ failure, like chronic obstructive pulmonary disease (COPD) or CHF have a long period of slow functional decline, with acute exacerbations of their disease and a sudden death, often during an exacerbation.
3. (Older) patients with frailty or dementia have a long period of slow functional decline until death.

Such a general description of disease trajectories can be helpful for physicians in deciding when to start palliative care, but also has its limitations. The time between diagnosis of a life-threatening disease and death can vary between weeks and decades. In the period following diagnosis, there is not always a need for extra care. Besides, often patients deny having a life-limiting disease, and are learning how to live with it. Starting palliative care or talking about the end of life in this stage often seems unrealistic, and in some cases even undesirable. It even might cause medicalisation and might be superfluous.

On the other hand, difficulties in predicting mortality, prognosis, and survival might also cause a prognostic paralysis of the physician, caused by concerns to take away hope or to burden the patient and relatives.[44]

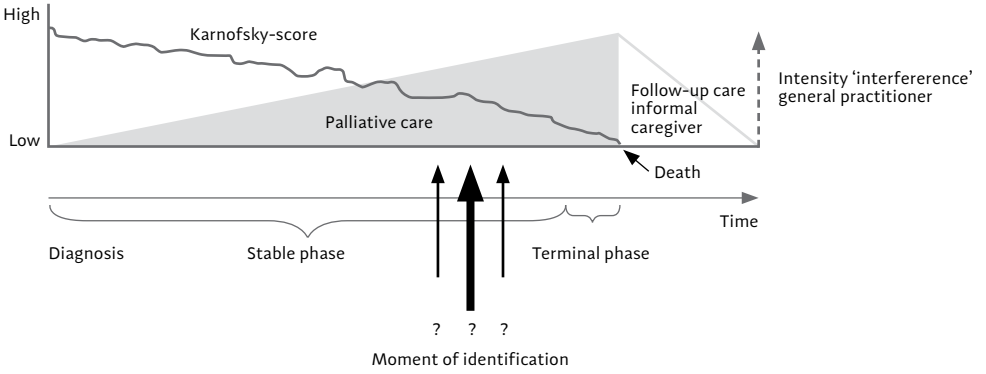
The right moment?

Taking these deliberations into account: what might be the correct moment to start palliative care? (Figure 3)

As an attempt to answer this question, the developers of the Gold Standards Framework (GSF) published for several chronic diseases a number of aspects on their website, that could be used as a trigger to start talking with a patient and family about end-of-life decisions and wishes.[45] In 2008 the 'surprise question' was introduced; a question a physician asks himself: 'Would I be surprised if this patient were to die in the next 12 months?'[46] In the period that I started my PhD-trajectory, neither the GSF nor the surprise question were validated; no single scientific publication about the GSF was available.

Early identification of patients that might benefit from palliative care enables to merge palliative care with disease-oriented treatment. It has been shown that palliative care improves satisfaction with care, and decreases acute interventions, like hospitalisations.[47-50] Besides, it increases the percentage of patients that die at home, which is the preferred place to die of the majority of the Dutch population.[51]

Figure 3 - What is the moment to start palliative care? a modified figure of Lynn and Adamson[42]



PROACTIVE PALLIATIVE CARE PLANNING

A next challenge concerns the second part of the WHO definition[1]: the prevention and relief of suffering by means of early identification and impeccable assessment and treatment of pain and other problems, physical, psychosocial and spiritual. To reach this aim, a thorough assessment of actual symptoms and needs as well as possible future scenarios is needed, in which as well the person, his disease and his social context are considered. Palliative care programmes appear to decrease distress and to increase patient and family caregiver satisfaction. Important elements of proactive palliative care planning are: discussing expected disease scenarios and advantages or disadvantages of several options for interventions, expected dying scenarios, advance care planning like treatment restrictions,[52-54] family strength and burden, and an assessment of physical, psychological, social and existential problems and needs.[55,56] Structured palliative care showed to increase the chance to die at home,[57,58] to decrease unexpected transfers,[59] length of hospitalisation and aggressive interventions, which appears to be cost-effective.[47,59] All these aspects contribute to the quality of the limited remaining life of patients and their families.

In our opinion, proactive palliative care planning is not limited to a single conversation with the patient, but asks for a series of conversations in the course of the palliative care trajectory. The above-mentioned aspects of proactive palliative care are discussed during these meetings with the patient and his family caregiver, in which plans, wishes and needs can be adapted to new insights over time as often as needed.

As for patients with chronic diseases and cancer often the medical specialist remains responsible for the disease-oriented treatment until an advanced stage of their disease, it

is a challenge for GPs to early identify the need for palliative care and to provide structured care planning for these patients simultaneously.[13]

As mentioned before, GPs work mainly demand-driven and provide reactive care. Proactive palliative care planning needs other habits and appeals to other skills. It does not follow a clear protocol, and asks professional creativity or out of the box thinking and acting. By recognising patterns of disease scenarios, the GP will be facilitated to set out a proactive policy or treatment plan, anticipating on possible complications.[60,61]

Mr Roos is still very fond of Ms Roos. Last year they celebrated their 60 years of marriage. They both loved it. Ms Roos is very concerned about the health of her husband. Almost every night she is afraid to go to bed. What if... he is so afraid, he is choking, he stops breathing, and he is going to die. She herself has difficulties walking because of osteoarthritis. Lately, she feels a little depressed. And she feels guilty that the care for her husband feels like a burden.

OUTLINE OF THIS THESIS

The aim of this thesis was to study training general practitioners in early identification and proactive palliative care planning of patients in need of palliative care from different perspectives.

The following sub-questions will be studied.

1. Can we systematically develop a tool for GPs for early identifying patients with CHF, COPD, and cancer respectively, who could benefit from proactive palliative care planning?
2. Does training of GPs in early identification and proactive palliative care planning improve the outcome of palliative patient with CHF, COPD and cancer as compared to untrained GPs?
3. What are the long-term effects of training GPs in early identification and proactive palliative care planning in the number of identified palliative patients and the content of the provided palliative care, as compared to untrained GPs, and what is the effect of the identification tool?
4. How do palliative care specialist consultants and trained GP's evaluate the training in early identification and proactive palliative care planning?

In chapter 2 we report the development of the RADboud indicators for PAlliative Care needs to identify those patients with cancer, COPD or CHF that might profit of a palliative care approach. In chapter 3 we report the incentive for and methods of the randomised controlled trial (RCT) to study the effect of a training in early identification of and proactive palliative care for GPs. Chapter 4 reports the results of the RCT: Training general practitioners in early identification and proactive palliative care planning. Chapter 5 describes the effect of

training general practitioners in early identification of their palliative patients and chapter 6 describes how GPs and specialist consultants evaluated several aspects of the training and its impact on their daily practice.

Finally, in the general discussion and conclusions we summarise our findings and place these in perspective of the contemporary situation and give some direction of future research (Chapter 7).

After a period in which he weekly went to hospital day care for management of fluid overload, in a shared decision making process of Mr Roos and his wife, the GP, the cardiologist, it was decided to inactivate the implantable cardioverter defibrillator (ICD), and to extend home care. The next day's Mr Roos became tired, dead tired, and very short of breath. Medications don't provide relief anymore. He bides farewell to his wife, his children and his life. In the end he was sedated to relief his intractable symptoms and died at home amidst his wife and children.

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2 Early identification of palliative care patients in general practice: development of RADboud indicators for PAlliative Care needs

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Br J Gen Pract. 2012 Sep;62(602):e625-31

Abstract

Background

According to the World Health Organisation (WHO) definition, palliative care should be initiated in an early phase and not be restricted to terminal care. In the literature, no validated tools predicting the optimal timing for initiating palliative care have been determined.

Aim

The aim of this study was to systematically develop a tool for GPs with which they can identify patients with congestive heart failure (CHF), chronic obstructive pulmonary disease (COPD), and cancer respectively, who could benefit from proactive palliative care.

Design

A three-step procedure, including a literature review, focus group interviews with input from the multidisciplinary field of palliative healthcare professionals, and a modified Rand Delphi process with GPs.

Method

The three-step procedure was used to develop sets of indicators for the early identification of CHF, COPD, and cancer patients who could benefit from palliative care.

Results

Three comprehensive sets of indicators were developed to support GPs in identifying patients with CHF, COPD, and cancer in need of palliative care. For CHF, seven indicators were found: for example, frequent hospital admissions. For COPD, six indicators were found: such as, Karnofsky score ≤50%. For cancer, eight indicators were found: for example, worse prognosis of the primary tumour.

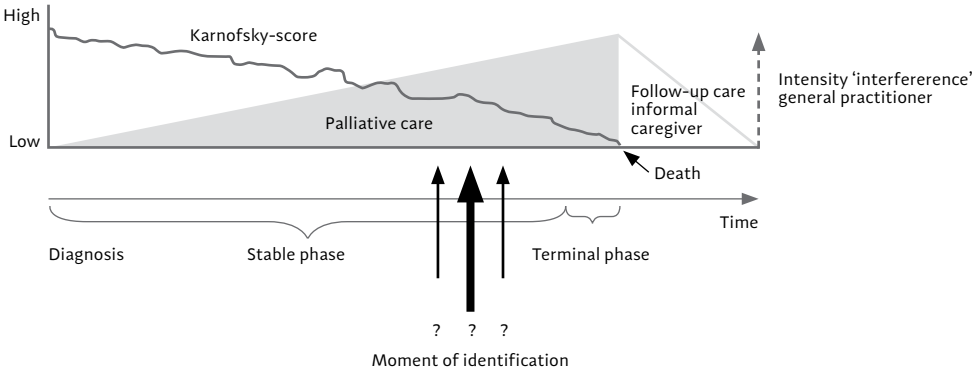
Conclusion

The RADboud indicators for PAlliative Care needs (RADPAC) is the first tool developed from a combination of scientific evidence and practice experience that can help GPs in the identification of patients with CHF, COPD, or cancer, in need of palliative care. Applying the RADPAC facilitates the start of proactive palliative care and aims to improve the quality of palliative care in general practice.

INTRODUCTION

In the UK and in the Netherlands, the large majority of deaths are due to circulatory disease, respiratory disease, or cancer.[1,2] In a substantial number of these cases, death resulted after a protracted end stage that may often last over a year: the palliative stage. Most patients prefer to spend the final phase of their lives primarily at home and also prefer to die there,[1,3] making the GP the most appropriate healthcare professional to initiate, provide and coordinate palliative care.[4-7] Yet, only a minority of these palliative patients die at home.[3,8,9] According to the World Health Organisation (WHO) definition, palliative care should be initiated in an early phase and not be restricted to terminal care.[10] However, to date, palliative care is often restricted to physical symptom relief in the terminal phase, including emergency visits by the GP,[11] transfers,[12] and unplanned hospital admissions.[13,14] Consequently, too many patients die in another place than preferred.[15,16] By recognising the needs of palliative cancer and non-cancer patients earlier, proactive care planning (including assessment and treatment of the physical, psychological, spiritual, and social consequences of the patient's situation and condition) might improve the quality of their remaining life. Nevertheless, early identification of patients who can benefit from palliative care is challenging. In patients with chronic obstructive disease (COPD) or congestive heart failure (CHF), but also in patients with advanced cancer, disease trajectories can last many years. Therefore, it is difficult to mark on the gradual slope of the different disease trajectories the moment when palliative care could be beneficial alongside or instead of disease-oriented therapies (Figure 1).[6,17-20] In published studies, unidentified palliative care patients with (non-cancer) chronic diseases received fewer drugs for palliation than patients with cancer, while the symptom burden was at least comparable.[21,22] Furthermore, end-of-life issues and preferred place of death are more frequently discussed with cancer patients than with patients with life-threatening non-cancer diseases.[22,23] Particularly with regard to non-cancer chronic

Figure 1 - What is the moment to start palliative care? a modified figure of Lynn and Adamson[59]



diseases, clinicians do not know when to initiate or how to communicate a palliative care approach.[6,24-26] For GPs in the UK, there are financial incentives for participating in the system for performance management and payment, including the timely inclusion of patients in the palliative care register.[27] Palliative care providers, including GPs, report that the most important gap is the lack of prognostic indicators and clinical triggers for initiating palliative care.[28] As physicians tend to overestimate the survival of their patients,[29,30] the use of the single surprise question: 'Would I be surprised if the person in front of me died in the next six months or one year?' as a prompt to initiate discussions about end-of-life needs and preferences is regarded as inappropriate. Small *et al.* suggest making it more explicit for patients with CHF and COPD.[31] In 2008, in the UK's Department of Health published an end-of-life care strategy, in which identifying people approaching end of life is one of the key subjects.[32] This strategy is partly based on the Gold Standards Framework (GSF). GPs in the UK are familiar with this GSF, which includes a prognostic indicator guide.[33] Yet the indicators used in the GSF are not evidence-based. To date, the study has been unable to identify any validated tools predicting the optimal timing for initiating palliative care,[34] although a great deal of research has focused on predicting mortality, survival, and prognostication.[35-43] Therefore, the aim of this study is to systematically develop a tool to identify patients with CHF, COPD and cancer respectively, based on the combination of evidence and practice-based knowledge. This tool could be used in regular patient contacts to help identify patients in need of palliative care and thus serve as a starting point for (proactive) palliative care.

METHODS

Design

A three-step procedure was used to develop sets of indicators for the early identification of patients with CHF, COPD and cancer who could benefit from palliative care.

Firstly, a structured Pub Med literature review was performed (Box 1; Figure 2, step 1). The cross references and the *Oxford Textbook of Palliative Medicine*, and relevant national and international websites were checked. Inclusion criteria used were English language, human research and patients aged >18 years. The titles and abstracts of the articles found in relation to potential indicators for identifying palliative patients were examined. A potential indicator was defined as 'a characteristic, factor, or aspect suggested as a possible indicator predicting or influencing prognosis, survival, or transition from a curative to a palliative trajectory in CHF, COPD and cancer'. If an abstract mentioned potential indicators, the full text was read. Information was collected on study design, population, research question, outcome and extracted potential indicators (Additional file 1).

Box 1 – Search strategy

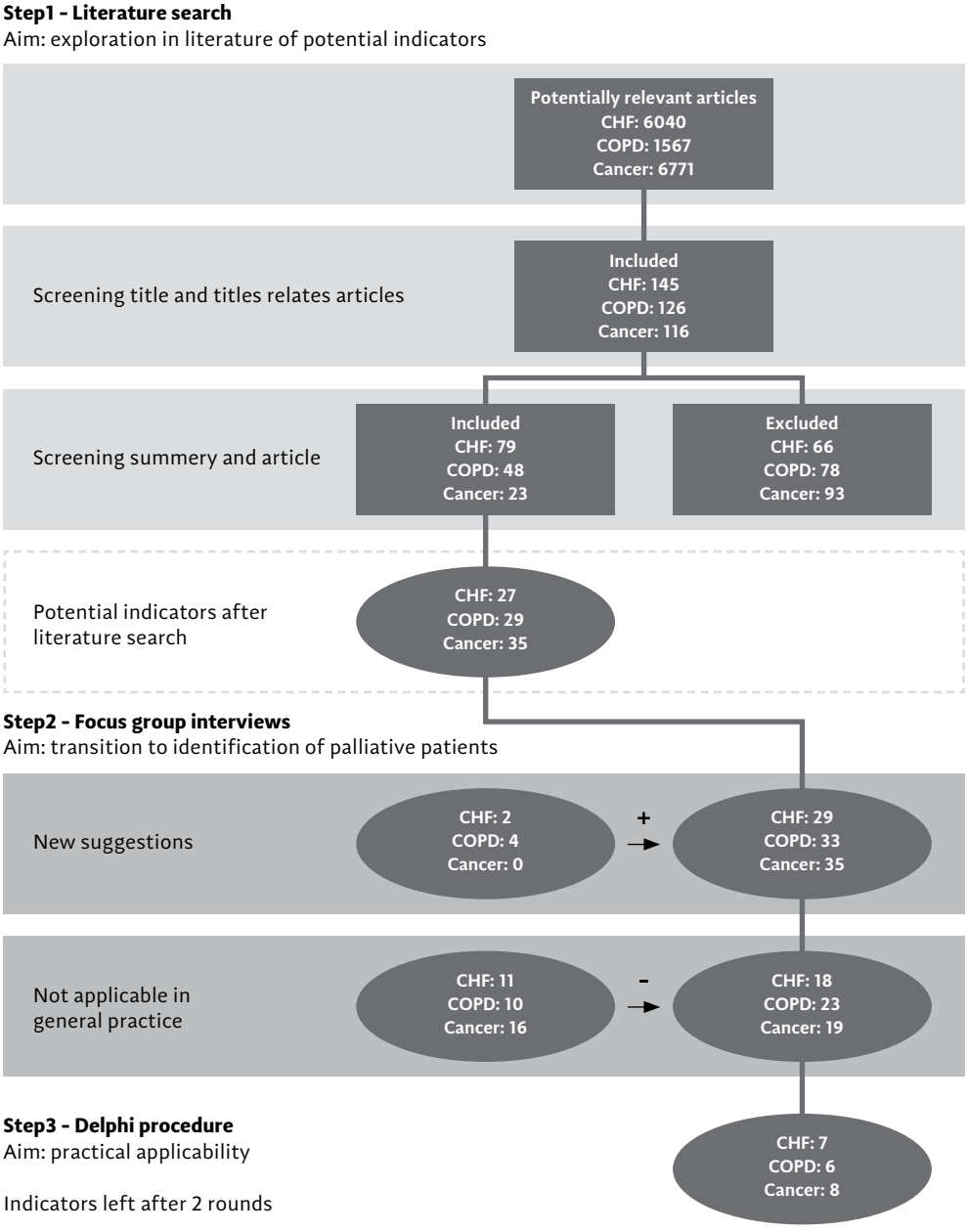
"Heart Failure"[Mesh] AND ("Palliative care"[Mesh] OR "Mortality"[Mesh] OR "Prognosis"[Mesh] OR "Survival"[Mesh] OR "Health Status Indicators"[Mesh] OR Prognostication[tw] OR End of life care[tw] OR "Advance Care Planning"[Mesh]) AND ("humans"[Mesh Terms] AND English[lang] AND "adult"[Mesh Terms] AND ("1"[PDAT] : "2008/07/01"[PDAT]))

"Pulmonary Disease, Chronic Obstructive"[Mesh] AND ("Palliative care"[Mesh] OR "Mortality"[Mesh] OR "Prognosis"[Mesh] OR "Survival"[Mesh] OR "Health Status Indicators"[Mesh] OR Prognostication[tw] OR End of life care[tw] OR "Advance Care Planning"[Mesh]) AND ("humans"[Mesh Terms] AND English[lang] AND "adult"[Mesh Terms] AND ("1"[PDAT] : "2008/07/01"[PDAT]))

"Neoplasms"[Mesh:NoExp] AND ("Palliative care"[Mesh] OR "Mortality"[Mesh] OR "Prognosis"[Mesh] OR "Survival"[Mesh] OR "Health Status Indicators"[Mesh] OR Prognostication[tw] OR End of life care[tw] OR "Advance Care Planning"[Mesh]) AND ("humans"[Mesh Terms] AND English[lang] AND "adult"[Mesh Terms] AND ("1"[PDAT] : "2008/07/01"[PDAT]))

Secondly, as it was expected that the indicators found in the literature search would mainly concern prognostication or survival and not early identification of palliative patients, three focus group interviews were organised. These focus groups respectively discussed CHF, COPD and cancer (Figure 2, step 2) with GPs and experts in the respective fields, all with a focus on palliative care. The focus group interview was led by an experienced moderator, to discuss the applicability of each indicator for early identification and to suggest additional indicators based on clinical experience. The panel prepared themselves by performing a web-based survey enabling them to consider their own strategy for identifying patients who might benefit from palliative care. During the focus group interview, an inventory was made of their indicators and these were compared to those found in literature. When concordance existed between an indicator found in literature and that suggested by the group, this indicator was accepted. If this concordance did not exist, a discussion followed to reject or accept it as a possible indicator. A possible indicator was rejected or accepted if a majority of the experts did or did not agree, respectively, on its usefulness. All experts had at least five years' experience in the respective fields of CHF, COPD or oncology.

Figure 2 - Results of the different components in the development of the RADboud indicators for PAlliative Care needs



Thirdly, a modified Rand Delphi process was performed to select those indicators that are appropriate and useful in general practice.[44] GPs with palliative care expertise were invited to participate in this written procedure, and each was asked to propose another GP with no special interest and expertise. They were asked to rate each concept indicator on a nine-point Likert scale with regard to timing (appropriate to determine the moment at which patients might benefit from starting proactive palliative care) and usefulness in general practice. Scales ran from 1 = extremely inappropriate / extremely unuseful to 9 = extremely appropriate / extremely useful. Additionally, they had the opportunity to refine the description of each concept indicator. After the first round, median ratings, as well as personal ratings of each concept indicator were calculated and sent back with the invitation to rate and respond to the indicators again. The rounds were repeated until consensus was reached. The study ran from December 2007 to August 2008.

Analyses

All focus group sessions were audio-taped, transcribed, and analysed. Analysis of the Delphi process was based on the Rand Appropriateness Method.[45] Median ratings of each concept indicator with respect to usefulness 'for appropriate timing' and 'in general practice' were calculated. Criteria for keeping a concept indicator in the final set were: (1) median rating ≥7 for as well appropriateness as usefulness, and (2) difference between maximum and minimum rating ≤4 in the second Delphi round.[44,46,47] The summary statistics were fed back to the participants at each round, along with their initial ranking. The analyses were performed using SPSS (version 16.0).

RESULTS

Figure 2 represents the results of the different components in the development of the RADboud indicators for PAlliative Care needs (RADPAC).

Focus group interviews

In total, 25 experts participated in the focus group interviews in which the potential indicators were discussed: five GPs, five medical specialists (a cardiologist in the focus group about CHF, two lung specialists in the focus group about COPD, and two oncologists in the focus group about cancer), four nursing home physicians, four psychologists, one nurse practitioner, three nurses, one priest, and two theologians. The main reason for rejecting indicators was the limited clinical utility of indicators in general practice. Rejected indicators were not used in the Delphi process.

Delphi process

Thirty-eight GPs were invited to participate in the modified Rand Delphi process, 15 of whom accepted, 11 with and four with no special interest or expertise in palliative care.

Responses were received from seven of the first type of GPs and three GPs from the other category. All respondents agreed to be involved in the second Delphi round as well. In the second round, eight out of 10 responded, consisting of seven GPs with special interest and expertise and one GP without. The RADPAC indicators presented in Table 1. For all diseases, a Karnofsky score of 50% or lower appeared to be an indicator. Also, signals given by the patient that the end of life is near, or a diminished 'drive to live' were considered important signs for all three diseases. Weight loss was rated high for COPD and cancer and, conversely, gaining weight for CHF. Additional indicators for COPD were the presence of CHF, orthopnoea and dyspnoea. With regard to CHF, a New York Heart Association (NYHA) IV score, frequent hospital admissions, and frequent exacerbations of severe heart failure were included. For cancer, having a primary tumour with poor prognosis and the anorexia-cachexia syndrome were considered relevant signs.

Table 1 – The RADboud indicators for PAlliative Care needs (RADPAC)

Congestive Heart Failure	1. The patient has severe limitations, experiences symptoms even while at rest. Mostly bedbound patients. (NYHA IV) 2. There were frequent hospital admissions (>3 per year) 3. The patient has frequent exacerbations of severe heart failure (>3 per year) 4. The patient is moderately disabled; dependent. Requires considerable assistance and frequent care (Karnofsky score ≤50%) 5. The patient's weight increases and fails to respond to increased dose of diuretics 6. General deterioration of the clinical situation (oedema, orthopnoea, nycturia, dyspnoea) 7. The patient mentions 'end of life approaching'
Chronic Obstructive Pulmonary Disease	1. The patient is moderately disabled; dependent. Requires considerable assistance and frequent care (Karnofsky score ≤50%) 2. The patient has substantial weight loss (±10% loss of bodyweight in six months) 3. The presence of congestive heart failure 4. The patient has orthopnoea 5. The patient mentions 'end of life approaching' 6. There are objective signs of serious dyspnoea (decreased dyspnoea d'effort, dyspnoea with speaking, use of respiratory assistant muscles and orthopnoea)
Cancer	1. Patient has a primary tumour with a poor prognosis 2. Patient is moderately disabled; dependent. Requires considerable assistance and frequent care (Karnofsky score ≤50%) 3. There is a progressive decline in physical functioning 4. The patient is progressively bedridden 5. The patient has a diminished food intake 6. The presence of progressive weight loss 7. The presence of the anorexia-cachexia syndrome (lack of appetite, general weakness, emaciating, muscular atrophy) 8. The patient has a diminished 'drive to live'

DISCUSSION

Summary

This study developed the RADPAC: three comprehensive sets of indicators to help GPs identify patients with CHF, COPD, or cancer in need of palliative care. A three-step procedure was used, including a literature review, focus group interviews with input from the multidisciplinary field of palliative healthcare professionals, and a modified Rand Delphi process with GPs.

Strengths and limitations

Review of literature in this new field was carried out thoroughly, but as indicators are not a MESH term, proxies of this term had to be used. For the focus groups, a purposive sampling strategy and thus a variety of expertise and experience in palliative care and general practice was captured. The knowledge and experience of those GPs who took part in the Delphi process was not measured, although we did include GPs with special training in palliative care as well as GPs with no special interest.

Whether the RADPAC will support GPs in the early identification of patients who might benefit from palliative care is unknown. RADPAC is under study in a randomised controlled trial (RCT) including 158 GPs in the Netherlands. Data on this study will be published separately. The RADPAC was developed for use in general practice. The different professionals who participated in the expert panel sessions reflect the multidisciplinary approach of palliative care. The involvement of GPs in the focus group interviews and in the Delphi process increases the chance that the RADPAC will be used in general practice.[48]

Comparison with existing literature

Several lists are available that encourage physicians to identify patients who could benefit from palliative care.[20,49–51] However, this study is the first to present indicators of the palliative care trajectory developed from a combined practice experience and scientific evidence base. Despite different development strategies, RADPAC has much in common with the prognostic indicator guide of the Gold Standards Framework (GSF-PIG).[33] In the UK, the GSF has been adopted by many GPs and seems to have value in daily practice to improve end-of-life care.[52] The GSF-PIG was developed by consulting different professional representatives while RADPAC used a three-step procedure. Yet both approaches have resulted in very similar indicators, which strengthen their validity. As RADPAC and GSF-PIG were developed in different health care settings, it may also indicate that both instruments address generic palliative care guidance for general practice.

The three sets of indicators in the RADPAC might improve different aspects of palliative care. A recent study showed that GPs who are aware of the patient's preferred place of death tend to have a palliative care goal and use palliative care services more often.[16] The need for timely exploration of care preferences and a focus on palliative care in order to improve its quality was important. Early introduction of palliative care for patients with lung cancer appeared to improve quality of life and survival time.[53] Early identification creates more opportunities for better symptom management and communication about the full content of palliative care and end-of-life care, such as preferred place of death and advanced care planning. GPs who used advanced care planning reported a higher percentage of death at home,[54] positively enhanced patients' hope.[55]

RADPAC is not intended to be a strict calculator. It has been developed to consider starting palliative care in patients at an earlier stage in highly prevalent chronic and life-threatening diseases. This study have provided the GPs concrete sets of indicators to consider whether the patient has 'palliative care needs,' besides diagnosing and treating their current health problems. As specific indicators developed for the identification of palliative care patients in a hospital setting will not be applicable in primary care, the emphasis in the selection of indicators lies in the usefulness and applicability in primary care. Indicators like hypercapnia for patients with COPD,[56] hyponatremia for CHF,[57,58] and percentage lymphocytes for patients with cancer[35,38] are not useful for early identification in general practice and have not therefore been selected. Despite its explicit invitation to consider 'early identification of palliative patients', the RADPAC still identifies rather late in the illness trajectory. This might be explained by the fact that when this research started, early identification in the Netherlands was not common practice. Although 'early identification' was explained by text and Figure 1, participants may still struggle with concepts like 'end-of-life' care, 'palliative care' and 'terminal' care. As health care systems, insights, and procedures change over time, the RADPAC should be updated.

The RADPAC contains solely somatic indicators. Although GPs known for their holistic approach, and also a psychologist and spiritual caregiver, were represented in the focus group panel, they may have been influenced by the medical specialists and by the given input of literature. The decision to identify a patient as in need of palliative care could be influenced by other factors than medical ones, such as culture, attitude, and moral ideas of a society, financial recourses and restrictions. This multifactorial character of the decision, combined with the subjective professional view, may mean that the RADPAC and the GSF-PIG is not sufficient enough to standardize this decision.

Implications for practice and research

This study, developing the RADPAC, is the first scientific study to translate an important part of the WHO definition for palliative care, namely early identification, to clinical practice in a scientifically sound way. The RADPAC can help GPs identify palliative care patients within their larger population of patients with CHF, COPD, or cancer. Applying the RADPAC is an opportunity to enable proactive care and thus improve the quality of primary palliative care. The validity and effect of the RADPAC will be further investigated in an RCT to investigate whether early identification and proactive palliative care planning coordinated by the GP will help improve the quality of palliative care. These results will be published separately. As the RADPAC only contains somatic indicators, special attention will be devoted to other domains, such as psychosocial, financial and spiritual domains, in an update.

ACKNOWLEDGEMENTS

The research group would like to thank all those who participated in the various focus groups and the GPs who participated in the Delphi process. This project was financially supported by a grant of the Netherlands Organisation for Health Research and Development–ZonMw, The Hague. Project number 1150.0002

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Additional file 1 – Descriptions of included articles and possible indicators after literature search

Table 1 - Descriptions of the included studies: COPD

	Author	Article	Design	Patients	Research question	Outcome	Variables	Recommendation
1	Coventry	Review	Systematic review	Non malignant Life threatening	To identify and evaluate potential decision making tools and predictor variables that might aid clinicians determine short term (<6 months) survival in older non-cancer patients	Prognosis Mortality	Age Mid thigh muscle cross sectional area Level of dyspnoea Peak VO_2 St George Respiratory Questionnaire FEV1 <30% Arterial blood gas measurements Cor pulmonale with pulmonary HT Health status Exercise capacity Weight loss	
2	Yohannes			100 patients admitted with acute exacerbation of COPD	To assess the sensitivity , specificity and positive and negative predictive values of any factors predicting 1-year mortality in individuals	Mortality predictors	Use of long term oxygen therapy Subsequent readmission Depression Disability, Low quality of life Length of original hospital stay	
3	Baptista	Letters to the editor						Reaction on Yohannes et al[2] They disagree with Y. et al, given the high 1-y mortality after discharge hospital after acute exacerbation COPD palliative care should be provided to patients with advanced COPD Is it not the primary goal to lengthen patients' life and improve quality of life? Physicians should optimise patients management.
4	Murray	Discussion paper			Some pointers to help clinicians identify patients with CODP who might benefit from a holistic patient centred approach	Possible ways for identifying patients with COPD	Hospital admission for a severe exacerbation of COPD Being housebound due to COPD FEV1 <30% On long-term O_2 therapy Depression/poor quality of life Low BMI/co-morbidity (especially heart failure) GPs and nurses asking themselves the question: would I be surprised if my patient were to die the next 12 months?	No methods section

	Author	Article	Design	Patients	Research question	Outcome	Variables	Recommendation
5	Yohannes	Commentary			Examine why patients with severe COPD do not receive appropriate palliative care simultaneously when receiving active treatment		Low self esteem Poor health status Low physical activity Severe dyspnoea Fatigue -> associated with frequent hospitalisation and premature death	Compared to terminal lung cancer, lower levels of self efficacy, greater disability, poor quality of life, higher levels of anxiety and depression
6	Childers	Fast facts and concepts			Reviews currently available COPD prognostic information		Ambulatory patients FEV1 <35% (25% die within two years, 55% in 4 years) Age Low BMI Low PaO_2 Bode scale: BMI, exercise capacity and subjective dyspnoea -> correlation with mortality	COPD heterogeneous disease without a simple prognostic trajectory
7	Seamark	Review				Mortality Prognostic factors	Frequent exacerbation Worse health status Admission in hospital Age FEV1 Cardiovascular problems Weight loss O_2 therapy Would I be surprised if my patients were to die the next 12 months?	Mortality is high after admission in hospital with rates a 3 months 16-19%, 12 months 22-43% Features related to poor prognosis in COPD FEV1 <30% Frequent exacerbations O_2 therapy Clinician's expectation of death in the next 12 months Development cor pulmonale
8	Sussman	Document of the Gilead centre			When to consider palliative care	Palliative care	Dyspnoea at rest Signs and symptoms of right heart failure O_2 saturation on O_2 of <80% pCO_2 >50 Unintentional weight loss	

	Author	Article	Design	Patients	Research question	Outcome	Variables	Recommendation
9	Halllenbeck	Chapter			Dying trajectories and prognostication	Prognosis	Oxygen dependent Unresponsive to bronchodilators FEV1 after bronchodilator less than 30% of predicted At best able to walk a few steps without tiring Resting pCO_2 >50 O_2 saturation of O_2 <88 pO_2 <55 on oxygen Cor pulmonale Unintended weight loss >10% of body weight Resting tachycardia. 100 2-3 acute care admits for COPD in the past year	
10	Thomas	Document, Gold Standards Framework			Prognostic Indicator Guidance Revised Vs 5. Sept 08, a Guidance to enable better identification of patients who may need supportive/ palliative care	Palliative care	Surprise question Patient makes a choice for comfort care Disease assessed to be severe e.g. (FEV1 <30% predicted – with caveats about quality of testing) · Recurrent hospital admission (>3 admissions in 12 months for COPD exacerbations) · Fulfils Long Term Oxygen Therapy Criteria · MRC grade 4/5 – shortness of breath after 100 meters on the level or confined to house through breathlessness · Signs and symptoms of right heart failure · Combination of other factors e.g. anorexia, previous ITU/NIV/resistant organism, depression · >6 weeks of systemic steroids for COPD in the preceding 12 months	

	Author	Article	Design	Patients	Research question	Outcome	Variables	Recommendation
11	Stuart	Guideline The National hospice Organisation				To identify which patients with non-oncologic terminal illness are likely to have significantly decreased prognosis if the disease runs its normal course	1. Severity of chronic lung disease a. disabling dyspnoea at rest, poorly unresponsiveness to bronchodilators decreased functional activity often exacerbated by other debilitating symptoms (fatigue/cough) FEV1 <30% b. progressive pulmonary disease increasing visits to emergency department or hospitalisation for pulmonary infections/ respiratory failure decreased FEV1 >40 ml a year 2. Presence of cor pulmonale or right heart failure 3. Hypoxia at rest on supplemental oxygen a. pO_2 <55 on supplemental O_2 b. oxygen saturation <88% on supplemental O_2 4. Hypercapnia a. pCO_2 >50 5. Unintentional weight loss >10% of bodyweight over the preceding 6 months 6. Rust tachycardia >100/min in a patient with severe COPD	
12	Oga	Article	Prospective study	n=150 Male Outpatients Follow up 5 y	To analyse the relationships of exercise capacity and health status to mortality	Mortality	Exercise capacity Health status Age FEV1 BMI	Health status depending on the instruments used. Exercise capacity, exercise in laboratory
13	Nishimura	Article	Prospective study	n=183 Hospital Follow up 5 y	To compare the effects of the level of dyspnoea with disease severity as defined by airway obstruction on mortality in patients with COPD	Mortality	Level of dyspnoea	
14	Marquis	Article		n=142 stable COPD follow up 41 months	To test the hypothesis that a reduction in midthigh muscle cross-sectional area obtained by CT is a better predictor of mortality in chronic obstructive pulmonary disease than lower body mass index	Mortality	Midthigh muscle area	Strong predictor mortality for patients with FEV1 <50% and midthigh muscle area <70%

	Author	Article	Design	Patients	Research question	Outcome	Variables	Recommendation
15	Walke	Article	Observational cohort study	Community dwelling persons, >60y,with COPD n=79 follow up 1 Y	To examine the prevalence and severity of a range of symptoms among a cohort of community dwelling persons to determine whether higher symptom burden was limited to persons at the very end of life	Symptoms	Bed to chair functional status Hospitalisation within the past 6 months with breathlessness Respiratory failure, mental status chase as main reason for hospital admission, and pO_2<60, and pCO_2>50 Having any of the 2 following pCO_2>45 Cor pulmonale FEV1<50% Polycythemia	Criteria used to describe advanced illness
16	Lanken	Practical guideline		Patients with respiratory disease and critical illnesses	To provide a set of basic knowledge regarding the application of palliative care to common clinical practice situations	Palliative care	All stages of disease Hospice eligibility criteria 1. severe chronic lung disease 2. hypoxemia 3. Cor pulmonale 4. Unintentional weight loss 5. Resting tachycardia	Barriers to timely initiation of palliative care - discomfort that some physicians had to have a discussion - uncertain short term prognosis
17	Prescott	Article		COPD n=1612 No COPD n=8812	To present study was to prospectively study whether changes in BMI in subjects with COPD independently predict mortality	Mortality	Weight loss	
18	Groenewegen	Article		n=171 Hospital admission for acute exacerbation of COPD	To investigate prospectively the outcome for all patients with acute exacerbations COPD during hospital admission and after 1 year of follow-up and patient characteristics related to increased mortality rate	Mortality Potential determinants	Hospital admission Oral corticosteroids Age PCO_2	
19	Marti	Article		n=128 on long-term oxygen	To investigate the association between clinical variables and all-cause and respiratory mortality	Mortality	BMI <25 kg/m^2 Co-morbidity	
20	Gudmundsson	Article	Prospective study	n=416 Hospitalised for acute exacerbation Follow up 1 y	To analyse mortality and associated risk factors with special emphasis on health status, medications and co-morbidity	Mortality	Hospitalisation Older age Lower lung function Lower health status DM co-morbidity	

	Author	Article	Design	Patients	Research question	Outcome	Variables	Recommendation
21	Ng	Article		n=376 Hospitalised for acute exacerbation Follow up 1 Y	To evaluate the impact of depression on mortality, hospital admission, smoking, symptom burden and physical and social functioning	Mortality Hospital readmission	Depression	Depression increased mortality risk
22	Fox	Article	Multi-centre validation study	Hospital patients n=1016	To test the ability of current available criteria to identify a population with a survival prognosis of 6 months or less among seriously ill hospital patients	Descriptive and operational characteristics clinical criteria	General clinical criteria: Readmission within 2 months Homecare after discharge Activities of daily living dependency >3 Weight loss of 2.3 kg or more within 2 months Albumin level <25 g/l Disease specific criteria Cor pulmonale pO_2 < 55 mmHg on O_2	The used prognostic criteria were largely ineffective in predicting a prognosis of 6 months or lessw
23	Grbich	Study		Residents in aged care facilities with end-stage non-cancer		Criteria for measuring the eligibility of patients with end-stage non-cancer disease for palliative care services in residential aged care facilities	Adapted NHO-guidelines	Small numbers: 10 weeks data collection, 16 of the 69 patients died
24	Briggs				To develop a new prognostic index that is capable of predicting not only mortality but also COPD exacerbations and hospital episodes, but is simple enough to us in primary care	Mortality Hospitalisations Exacerbations	Quality of life FEV1% pred Age Sexe BMI History of cardiovascular disease History of emergency visits/exacerbations	

	Author	Article	Design	Patients	Research question	Outcome	Variables	Recommendation
25	Cote	Article		444 patients with chronic obstructive pulmonary disease (COPD) followed for a mean+/-SD period of 71+/-34 months	To compare the ability of the conventional BODE and the mBODE% to predict mortality	Prediction of mortality	BODE- index Body mass index Airflow obstruction Dyspnoea 6 min walk distance Modified BODE-index Body mass index Airflow obstruction Dyspnoea VO_2	6 min walk distance
26	Nie		Retrospective cohort study	Patients >60 y Admitted to hospital for COPD	To describe mortality of elderly patients after hospital admission for COPD	Mortality	Age Sexe Care of professional	Hospitalisation is associated with mortality
27	Fan		Prospective cohort study	610 patients with COPD	To determine whether depressive or anxiety symptoms are associated with COPD hospitalisation or mortality	Mortality Hospitalisation Emergency department visit	Depression	Depression is common in COPD Depressive symptoms are associated with increased risk of 3-year mortality
28	Budweiser	Article		197 COPD patients	To study the role of 6 min walking distance in chronic hypercapnic respiratory failure	Mortality survival	6 min walking distance	Predictive for long-term survival
29	Mc Ghan	Article		51353 patients discharged after an exacerbation of COPD	To determine predictors of rehospitalisation for COPD and death	Death Rehospitalisations	Age Sexe Prior hospitalisations Co morbidities Weight loss Pulmonary hypertension	
30	Hodgev		Prospective cohort study	63 COPD patients	To assess the prognostic role of maximal inspiratory pressure and other lung function parameters	Mortality	Lower maximal inspiratory pressure	
31	Budweiser			188 patients discharged from hospital receiving non-invasive ventilation	To enhance knowledge of prognostic parameters for patients with COPD with non-invasive home ventilation	Survival	Age BMI Hb FEV1 Specific airway resistance Residual volume/total lung capacity pH Base excess	

	Author	Article	Design	Patients	Research question	Outcome	Variables	Recommendation
32	Zulli		Prospective longitudinal study	246 COPD patients	To investigate the prognostic role of QT interval in predicting mortality in COPD	Mortality	Age >65 Partial oxygen pressure <60 mmHg Inspiratory capacity <80% Maximal QT interval, QTcD, QTD	
33	Yildiz		Prospective study	276 out-patients with COPD	To analyse the factors affecting survival of patients with COPD	Mortality	Age Level of dyspnoea Hypoxemia Number of hospital admissions	
34	Swallow			162 patients with COPD	To test the hypothesis that a reduction in quadriceps maximal voluntary contraction force is a predictor of mortality in patients with COPD	Death Lung transplantation	Quadriceps strength Age BMI FEV1	More powerful prognostic information than age, BMI and FEV1
35	Takigawa			144 COPD	To predict prognosis of COPD patients who underwent pulmonary rehabilitation	Prognosis	Albumin $PaCO_2$ 6 min walk test	
36	Machado		Prospective cohort study	435 outpatients with COPD	To measure survival difference between man and women with oxygen-dependent COPD	Survival	Sexe BMI Lower PO_2	
37	Man			4803 patients with mild to moderate COPD	To analyse if C-reactive protein is associated with clinical outcomes	Mortality	CRP	CRP levels were associated with all causes of mortality May enable more accurate detection of patients at high risk mortality
38	Vestbo		Population-based cohort study	1898 patients with COPD	To explore distribution of low fat-free mass index and its association with prognosis	Mortality	BMI Fat-free mass index	
39	Ringbaek		Prospective cohort study	221 hypoxemic COPD patients	To determine whether BMI and oral corticosteroid use predict survival and hospitalisation	Mortality Hospitalisation	BMI Oral corticosteroid use	
40	Gunen			205 patients	To assess the parameters related to in-hospital mortality and long-term survival after hospitalisation of patients with acute exacerbations of COPD	Mortality	Longer disease duration Lower albumin Lower PO_2 Lower BMI Time elapsed since first hospitalisation	
41	Soler-Cataluna		Prospective cohort study	304 men with COPD	To investigate whether sever acute exacerbations of COPD exert a direct effect on mortality	Prognosis Mortality	Exacerbations of COPD Frequency of exacerbations	Particularly if these require admission to hospital

	Author	Article	Design	Patients	Research question	Outcome	Variables	Recommendation
42	Slinde			86 patients	To study the mortality in patients with severe COPD included in a multidisciplinary rehabilitation program	Mortality	Age Number of hospital days Sexe Fat free mass index	
43	Stage			49 outpatients	To determine if presence of depression in patients suffering from COPD would have impact on mortality	Mortality	depression	Protector for mortality
44	Tojo			58 patients without hypoxia	To identify the best index for predicting long-term survival in patients with COPD during exercise testing	Mortality	FEV1 Age PaO_2max	
45	Celli			207 patients with COPD (validated 625 patient)	Hypnotizes that a multidimensional grading system that assessed the respiratory and systemic expressions of COPD would be categorize and predict outcome	Risk of death	BODE Body mass index Degree of airway obstruction Exercise capacity (6 min walk test)	
46	Oga			143 patients with COPD	To investigate the ability of health status derived from the Chronic Respiratory Disease Questionnaire (CRQ) to predict mortality in COPD	Mortality	Age FEV1	
47	Yohannes		Prospective cohort study	137 outpatients with symptomatic disabling COPD	To evaluate predictors of mortality in elderly patients with disabling COPD	Mortality	Disability Use of long-term oxygen therapy Pre-bronchodilator lung function BMI	
48	Lynn		Retrospective analysis of a prospective cohort	416 COPD patients who died within 1 year	To characterise COPD over patients last 6 months of life	Days in hospital Prognosis Illness severity Function Symptoms Patients preferences Impacts on families	Co morbidity Exacerbation COPD Cardiac problems Quality of life Symptoms	

Table 2 - Descriptions of the included studies: CHF

	Author	Article	Design	Patients	Research question	Outcome	Variables	Recommendation
49	Adams	Review			To disseminate the latest epidemiologic data on HF	Survival	Gender Age Discharge from hospital Progression of disease	BNP prognostic importance
50	Eichhorn	Review			To examine a variety of biochemical, hemodynamic, functional, and demographic risk factors and assess their relative value for predicting the outcome in patients with HF	Mortality	LVEF Age BNP Peak O_2 consumption Medication: ACE, B-blocker, spironolacton Cardiac norepinephrine spill over	
51	Ward	Article			To identify the major needs of specific areas of palliative care most relevant to HF patients	Prognosis	NYHA classification Six minute walk test Peak O_2 LVEF Hyponatriemia	
52	Quaglietti	Report	Review		To review the clinical and research issues associated with integrated care for HF in the clinic and home when palliation is the major issue	Survival	Gender Age Co-morbidity (MI, DM, COPD)	Inability to predict survival prognosis of 6 months or less in patients with CHF[22]
						Risk of death	Cardiomyopathy Hyponatriemia Pulmonary arterial diastolic pressure LV diastolic dimension index >44% Permanent pacemaker Peak O_2 during exercise	
53	Francis	Review				Survival	LVEF Exercise toleration Heart size	Determination of prognosis for decisions regarding heart transplantations
54	Cowie	Editorial				Mortality	NYHA classification Recent stay in hospital Higher creatinin concentration Lower systolic blood pressure Higher heart rate Advanced age Gender (Muntwyler et al, Eur J Heart 2002;23:1861-6) GP estimate 1 year mortality of their patients with heart failure (overestimate by factor of two) (Mosterd et al, Eur J Heart 2001;22:1318-27)	Prognostication: specialists and GP should pay more attention to the role of prognostication in their clinical practice. More research and better models

	Author	Article	Design	Patients	Research question	Outcome	Variables	Recommendation
55	Selman							Barriers to improving end-of life care Disease specific: unpredictable disease trajectory
56	Hauptman	Special article			Propose integration of palliative care approach early in course of HF Transition of focus to palliative care rather than mortality reduction Failure to respond to the need for palliative care puts at risk the mandate to treat the patient with heart failure during the entire course of illness	Prognosis	O_2 consumption by exercise Renal failure LVEF Heart rate Blood pressure Ischemic aetiology Hospitalisation NHO: guideline for determining prognosis in non-cancer diseases[11] Multiple emergency department visits Karnofsky <50% Impaired nutritional status (loss ≥ 10% body weight) Optimally treated with diuretics and vasodilators NYHA IV LVEF <20%	Algorithm for integrating palliative care into care of patients with advanced heart failure (Hospice care)
57	Huynh	Study	Secondary data analysis of a previously conducted randomised, clinical trial	282 HF ≥ 70 years	To identify predictors of 6-month mortality in older patients with HF and develop a rich score for identifying potential candidates for hospices care	All causes 6-month mortality	Four independent predictors 6 months mortality: Serum urea nitrogen > 30 mg/dL Systolic blood pressure < 120 mmHg Peripheral arterial disease Serum sodium <123mEq/L	
8	Sussman	Grey	When to consider palliative care				Heart disease: CHF symptoms at rest LVEF <20% New dysrhythmia Cardiac arrest, syncope or CVA Frequent ER visits for symptoms	

	Author	Article	Design	Patients	Research question	Outcome	Variables	Recommendation
22	Fox	Article	Multicentre validation study	Hospital patients 1404 CHF	To test the ability of current available criteria to identify a population with a survival prognosis of 6 months or less among seriously ill hospital patients	Descriptive and operational characteristics clinical criteria To predict survival at 6 months	General clinical criteria: Readmission within 2 months Homecare after discharge Activities of daily living dependency > 3 Weight loss of 2.3 kg or more within 2 months Albumin level <25 g/l Disease specific criteria EF < 20% Arrhythmia	The used prognostic criteria were largely ineffective in predicting a prognosis of 6 months or less
9	Hallenbeck	Book chapter				Criteria patients benefit palliative and hospice care	NYHA IV LVEF <20% Optimally treated including after load reduction 2 or 3 acute care admits for HF in the past year	
1	Coventry	Systematic Review		Non-malignant life-threatening		Tools and predictor variables that might aid clinicians estimate survival	Specific predictors of mortality: Advanced age LVEF <40% Arrhythmia Systolic hypotension	Differences between hospitalised and community-based patients should be acknowledged when determining short-term survival and appropriateness of palliative care in patients with CHF
58	Lee	Study	Retrospec-tive study	n=4031 hospitalised HF patients	To develop and externally validate a method to predict mortality risk in heart failure patients Hypothesized model could effec-tively stratify the risk of death among HF at both 30 days and 1 year	Predicting mortality 30-days 1- year	1-year predictors of mortality Age Systolic blood pressure Respiratory rate Hyponatremia Urea nitrogen concentration Low haemoglobin Co-morbidity	
59	Reisfield	Review				Prognosis	Recent cardiac hospitalisation Elevated blood urea nitrogen Systolic blood pressure LVEF Dysrhythmia, therapy resistant Anaemia Hyponatremia Cachexia Reduced functional capacity Co-morbidities	Providing accurate prognostic data for 6 to 12 month mortality is nearly impossible

	Author	Article	Design	Patients	Research question	Outcome	Variables	Recommendation
60	Ingle	Clinical research		Referred to community clinics with breathlessness and NYHA I-IV	Compare the prognostic value of the 6-MWT with physical symptoms	Mortality	6-min walk test Self perceived symptoms Orthopnoea B-blocker use Pro BNP Reduced Haemoglobin-concentration predictors poor 6-min in patients with poor LVEF increased age increased BMI lower haemoglobin-concentration increased resting heart rate Gender Elevated serum creatinine Pro BNP	In clinical practice the addition of a questionnaire of daily living activities is worthwhile for risk stratification in these patients
61	Murray	Paper	Quality interviews, a 3 month during a year	20 patients with inoperable lung cancer and advanced heart failure and their main informal and professional carers	Compare the illness trajectories, needs and service use of patients with cancer and those with advanced non-malignant disease		Advanced: NYHA IV	· HF-patients : poorer understanding of the illness and prognosis, and less opportunity to address end of life issues · Care for people with advanced progressive illness is currently prioritized by diagnosis rather than need. End of life care for patients with advanced cardiac failure and other non-malignant disease should be proactive and designed to meet their specific needs. · Some experiences of patients with cardiac failure
15	Walke	article	Observational cohort study	Community dwelling persons, >60y, with heart failure n=59 follow up 1 Y	To examine the prevalence and severity of a range of symptoms among a cohort of community dwelling persons to determine whether higher symptom burden was limited to persons at the very end of life	Symptoms	NYHA III-IV and use of at least 2 of the following medication classes: diuretics, inotropics, ACE, vasodilators · LVEF <20% and the use of at least 2 of the same classes if medications · Hospitalisation and NYHA IV (baseline dyspnoea at rest, systolic BP <100 mm Hg or hypotension	High symptom burden among older persons with HF, unmet needs for symptom assessment and treatment

	Author	Article	Design	Patients	Research question	Outcome	Variables	Recommendation
62	Rienstra	Study	Sub study Randomised international survival study (ibopramine versus placebo)	Clinical stable patients NYHA class III-IV	To evaluate prognostic value of natriutic peptides	Prognosis	NT pro BNP	
63	Glare	Letter		65 patients suffering from non malignant disease (e.g. heart failure: 7 patients)	To evaluate the prognostic accuracy of the PaP Score in patients approaching death from diseases other than cancer	Short-term survival		Preliminary results suggest that the PaP Score initially designed for use in cancer patients may be useful for predicting survival in terminally ill patients suffering for any disease Dead within a month
64	Jaagosild	Study	Prospective cohort study	1390 adult patients hospitalised with exacerbation of severe CHF (NYHA III-IV)	Describe patients whose primary reason for admission was acute exc. CHF To determine outcomes in terms of mortality, QOL and use of recourses	Mortality		After admission severe CHF have a generally poor 6-month survival 90 days survival: 80.8% 1-year survival: 61,5%
65	Fonarow	Article	Literature review		Discuss the epidemiology, mortality predictors an risk stratification models for patients hospitalizes with acute HF	Increased mortality	Age Gender Race Insurance History of previous hospitalisation CVA Dementia COPD Hepatic cirrhosis Cancer BMI SBP Heart rate Respiratory rate Sodium concentration, creatinine, urea, haemoglobin, albumin, troponine, BNP, LVEF (ADHERE, EURO HF, OPTIMISE HF) Age/sex/prior HF/LVEF < 40%/coronary heart disease/HT/DM/AF/renal failure	Be very poor post discharge: 11.3% at 30 days and 33.1% at 1 year in the US Estimates of the risk of death or rehospitalisation within 60 days of admission vary from 30% to 60% depending on the population studied. These statistics emphasize the need for identifying prognostic markers and clinically practical methods of risk stratification for patients hospitalised with acute HF syndromes.

	Author	Article	Design	Patients	Research question	Outcome	Variables	Recommendation
66	Murray	Editorial						Estimating prognosis is an inexact science, but prognostic uncertainty should not prevent us talking with our patients about this issue. So when we are next monitoring prognostic indicators and observe an irreversible decline, why not simply ask ourselves: Would I be surprised if my patient were to die in the next 12 months:
67	Stuart	Review	Literature review		To provides an evidence-based review of the principles underlying palliative care for heart failure	Mortality/prognosis	Functional status LVEF Hospitalised patients: Renal function BP Outpatients SEATLE Model EFFECT (hospitalised patients) hours of hospital presentation age respiratory rate Systolic blood pressure BUN Sodium Presence/absence of CVA Dementia CODP Hepatic serosis Cancer Anaemia <10 g/dL Cardiac cachexia Depression BNP	• one-year mortality after first admission for HF in elderly patients with co morbid conditions is over 60% • HF prognosis has been variable and difficult to predict • not surprisingly patient who die in HF tend to receive more life sustaining treatment than do those dying of cancer (Tanvetyanon et al Crit care med 2003) • Patients and clinicians tend to underestimate mortality in HF • 5 year survival following first admission for HF was worse than that seen in most cancers • SEATLE: 1-year, 2-year, 3-year survival -> calculation model (but validated in patients participating in clinical trials), not for patients with co-morbidity[68] • EFFECT: 30-days, 1-year

	Author	Article	Design	Patients	Research question	Outcome	Variables	Recommendation
68	Levy	Study		6 cohorts of patients with LV systolic heart failure. 1125 HF patients, validated in 5 cohorts	To develop and validate a multivariate risk model to estimate survival of heart failure patients that incorporates easily obtainable clinical and laboratory variables, heart failure med and devices	Survival	Age Gender NYHA LVEF Ischemic aetiology SBP Medications (diuretics, ACE,B-blocker, Agiotensin receptor blocker, K sparing diuretic, Allopurinol, Statin) Lab (sodium, creatinine, cholesterol, Haemoglobin, Leucocytes, lymphocytes) Implantable Cardioverter Defibrillator	Accurate estimate of 1-year, 2-year, 3-year survival ROC 73
69	Rodriguez-Artalejo	Study	Prospective study	394 patients admitted for HF-related emergencies	Examine the relationship between health-related quality of life and a first emergency rehospitalisation and mortality in patients with HF	Hospital readmission Death	Worse HRQL	Worse HRQL is associated with hospital readmission and death in patients with HF. The magnitude of this association, for both physical and mental HRQL components is comparable to that for other well known predictors of hospital readmission and death, such as personal history of diabetes, previous hospitalisation, and treatment with angiotensin-converting enzyme inhibitors
70	Hogg	State-of-the art paper	Review		To describe in detail the epidemiology, clinical characteristics and prognosis of patients with HF and preserved systolic function	Prognosis Mortality Hospital admissions		
71	Goldstein	Article			To explain the trajectory of patients with HF			Physicians cannot predict when a patient will deteriorate or which episode will be fatal

	Author	Article	Design	Patients	Research question	Outcome	Variables	Recommendation
72	Franklin	Review	Review		Review the current stage of knowledge regarding the prognosis of patients populations with HF	Mortality Prognosis	Mortality LVEF Age Presence of coronary disease Prognosis NYHA IV Age LVEF CAD Diabetics Mellitus Peripheral vascular disease Minority ethnic group Glomerular filtration rate BNP	
73	Fonarow	Study			Evaluate the association between precipitating factors identified at the time of HF hospital admission and subsequent clinical outcomes	Factors which influence clinical outcomes (early post discharge mortality, and death/ rehospitalisation) (60 days - 90 days)	Renal function High BP Non adherence to medication	
74	Barnes	Research paper		542 patients with HF > 60 Y in GP surgeries	To identify factors available to GP that are predictive of mortality within a general based population of HF-patients, and to report the sensitivity and specificity of prognostic information from GP's	Mortality	Gender NYHA Living alone Symptoms of depression Age SES Co morbidity Arthritis, lung disease, DM, stroke, cancer, Neurological conditions, and other conditions	• would I be surprised if this patient were to die in the next 12 months? • Identifying factors that are likely to influence death is useful in primary care, as this can initiate discussion about end of life care, particularly if GPs asking themselves the question 'would I be surprised if this person died within the next 12 months?'

	Author	Article	Design	Patients	Research question	Outcome	Variables	Recommendation
75	Ko	Study		9943 patients newly hospitalised HF patients	The primary objective of this study was to determine the life expectancy of a population-based cohort of patients with an index hospitalisation for HF	Mortality	Age Gender Admission characteristics SBP HR Creatinine Urea nitrogen Sodium Hb Cardiac risk factors and co-morbidity HT DM COPD VG: MI VG: stroke/TIA Dementia Hepatic serosis Cancer Mediation at hospital discharge Aspirin B Blocker ACE Statin LVEF <30%	30 days, 1-year and 5-year mortality ROC 0.76, 0.74, 0.77 EFFECT HF risk score Variable: Age RR SBP BUN Hyponatriemia CVA Dementia COPD Hepatic cirrhosis Cancer Low Hb
76	Sullivan	Study		142 consecutive subjects from a specialty heart failure clinic	To determine if commonly used summary health status measures have independent prognostic significance	Prognosis	LVEF VO_2 Serum sodium Co morbidity Heart rate Blood pressure Body mass index Third heart sound Cause of HF VG: MI VG: Revascularisation Symptoms of heart failure Seattle heart failure score 68 6 min walk test Disability score Depression/Anxiety Health status (SF 36, KCCQ) Health utility (Feeling thermometer, standard gamble)	Summary health status measures are simple and significant indicators of prognosis in advanced heart failure patients (KCCQ)

	Author	Article	Design	Patients	Research question	Outcome	Variables	Recommendation
77	Senni	Study		807 patients 305 patients at discharge, 309 outpatient clinic, 148 home care setting	Develop a simple model on the basis of routinely available clinical information to predict 1 y mortality	Mortality	Gender Age B blocker ACE NYHA III/IV LVEF Severe valvular disease > previous HF admissions AF Creatinine BUN SBP Sodium LVEF Co morbidity Anaemia, HT, COPD, DM, kidney disease, cancer, CVA, dementia, PAV, obesity, dyslipidema predictors of 1 year mortality Age Anaemia HT COPD DM Kidney failure Cancer ACE NYHA III/IV LVEF <20% Valvular disease AF	
78	De Graeff	Chapter			Heart failure and a worse prognosis	Prognosis	High age Previous admissions hospital Not reactive on treatment Co morbidity Depression Weight loss Sinus tachycardia Low RR Low urine production LVH Low potassium Progressive kidney failure Low VO_2-max	

	Author	Article	Design	Patients	Research question	Outcome	Variables	Recommendation
10	Thomas	Document			Prognostic Indicator Guidance Revised Vs 5. Sept 08, a Guidance to enable better identification of patients who may need supportive/ palliative care	Palliative care	Surprise question Patient makes a choice for comfort care Clinical prognostic indicator At least two of the indicators below: • CHF NYHA stage III or IV – shortness of breath at rest or minimal exertion • Patient thought to be in the last year of life by the care team – the 'surprise' question • Repeated hospital admissions with symptoms of heart failure • Difficult physical or psychological symptoms despite optimal tolerated therapy	
11	Stuart	Guideline The National hospice Organisation			To identify which patients with non-oncologic terminal illness are likely to have significantly decreased prognosis if the disease runs its normal course	Palliative care	1. symptoms of recurrent congestive heart failure at rest a. NYHA IV b. ejection fraction <20 % 2. optimally treated with diuretics and vasodilators, preferably ACE-inhibitors a. persistent symptoms despite maximal treatment b. optimally means, not on vasodilators have a medical reason for refusing these drugs (hypotension, or renal disease) 3. decreased survival: a. Symptomatic arrhythmia b. history of cardiac arrest c. unexplained syncope d. embolic CVA of cardiac origin e. HIV disease	
79	Grigorian-Shamagian		Prospective cohort study	1062 chronic heart failure patients	To investigate the influence of baseline blood pressure and changes in blood pressure during - year period on the survival of patients with heart failure	Survival	Low systolic blood pressure	
80	Avkarogullari			96 CHF and 50 age/sex matched subjects	To evaluate the relation between serum erythropoietin level and the severity of disease and mortality in patients with CHF	Mortality	Erythropoietin level	Needs further research

	Author	Article	Design	Patients	Research question	Outcome	Variables	Recommendation
81	Barretto			122 patients with NYHA II–IV	To test the hypothesis that the muscle sympathetic nerve activity and the forearm blood flow would predict mortality	Mortality	muscle sympathetic nerve activity forearm blood flow	
82	Szygula-Jurkiewicz			132 patients with NYHA II–III with hypertension related chronic CHF	To determine the predictors of major adverse cardiac events	Death Urgent heart transplantation Readmission to hospital	Depression High D-dimers level Right ventricular diastolic diameter	
83	Macchia			48117 patients with HF	To assess the relationship between depression and clinical outcome among elderly patients with CHF	Mortality	Depression	Depression had no increased risk on rehospitalisation for HF
84	Dini			219 stable HF patient	To evaluate the combined assessment of N-terminal pro-BNP and Doppler LV diastolic variables were relevant to the prognosis of patients with stable HF	Prognostic value	LV dysfunction NT-pro-BNP	
85	Van der Meer		Cohort study	74 anaemic CHF patients from a cohort of 240 patients with CHF	To examine the endogenous erythropoietin levels in patients with CHF and its relation to prognosis	Mortality	Endogenous erythropoietin	
86	Cauthen		Retrospective	444 patients	To determine the impact of blood urea nitrogen on long-term mortality in patient with stage B and C HF	Mortality	Blood urea nitrogen (BUN)	
87	Mullens			513 ambulatory patients with HF	To establish the importance of hemodynamic assessment in ambulatory patients with advanced heart failure	Mortality	Mean pulmonary pressure Cardiac index Mitral regurgitation Renal dysfunction	
88	Ahmed			5501 HF patients with no hospitalisation and 1732 HF with hospitalisations	To study the effect of incident hospitalisation on subsequent mortality	Mortality	Hospitalisation	
89	Moertl			166 patients HF after discharge	To evaluate the prognostic value of NT-pro-BNP in ambulatory heart failure patients after discharge	Prognosis	NT-pro-BNP	Prognostic information depends on the sub-group
90	Tang			6159 patients with stable heart failure	To determine the characteristics and long-term prognosis of anaemia in ambulatory patients with CHF	Survival	Anaemia	

	Author	Article	Design	Patients	Research question	Outcome	Variables	Recommendation
91	Tribouilloy		5 year observational study	368 patients	To evaluate the prognostic impact of diabetes mellitus in patients with heart failure and preserved ejection fraction	Mortality	Diabetes mellitus	
92	Andersson			365 patients >65 year	To determine predictors of outcome in elderly heart failure patients	Mortality	NT-pro-BNP level NYHA	
93	Schou			345 patients EF <.45	To test the hypothesis that anaemia and NT-pro-BNP are associated and evaluated affects the prognostic value of each risk marker	Prognosis Mortality	Age LVEF BMI AF Chronic kidney disease Anaemia NT-pro-BNP	
94	Kenchaiah			7599 patients with NYHA II-IV	To examine the influence of BMI on prognosis in patients with chronic heart failure	Mortality	BMI	Underweight or low BMI was associated with increased mortality, primarily in patients without evidence of fluid overload
95	Arslan			43 patients with chronic heart failure NYHA II-III	To evaluate the prognostic value of the 6-minute walk test in stable outpatients with heart failure	Mortality	6 -minute walk test	
96	O'meara			8957 patients (2400 women/ 5199 men)	To test the hypotheses that sex-related differences in mortality and morbidity may due to differences in the cause of heart failure	Mortality Death Hospitalisation	Sexe	Women have lower risks of most fatal and non-fatal outcomes
97	Garty			4102 patients hospitalised	To identify factors that may affect their short and long term outcome in a national study	Mortality	NYHA III–IV Age Renal failure Anaemia Stroke COPD Atrial fibrillation	
98	Kosiborod			1358 patients with heart failure after myocardial infarction	To test whether serial health status assessment can identify patients at risk for mortality and hospitalisation	Mortality Hospitalisation	Health status assessment	Health status assessment (Kansas City Cardiomyopathy Questionnaire)

	Author	Article	Design	Patients	Research question	Outcome	Variables	Recommendation
99	Goldberg			2445 patients discharged after admission for acute heart failure	To publish data describing the contemporary long-term prognosis of patients hospitalised with decompensated heart failure	Mortality	Age History of COPD History of HF Elevated serum urea nitrogen levels during hospitalisation	37.3% died during 1 year 78.5% died during 5 year
100	Sherwood			204 outpatients with HF EF < 40%	To study the effect of depression to death or hospitalisation in patients with heart failure	Mortality Hospitalisation	Symptoms of depression	Use of antidepressant medication use was associated with increased likely hood of death or cardiovascular hospitalisation
101	Cicoira			5010 patients	To assess the relationship between body mass index, mortality and mode of death in chronic heart failure patients	Mortality	BMI	
102	Siirila-Waris			620 patients hospitalised due to acute heart failure	To investigate the characteristics, treatment and 1-year prognosis after acute heart failure and to identify prognostic factors	Mortality	Age Male Systolic blood pressure C-reactive protein Renal dysfunction	1-year mortality
103	Pascual			212 patients discharged after acute heart failure	To examine the role of hyperuricaemia as a prognostic marker	Death New heart failure Readmission	Hyperuricaemia	
104	Varadarajan			2246 patients after discharge diagnosis of congestive heart failure	To determine whether low Hb has an effect on survival in patients with CHF and normal ejection fraction	Survival	Low Hb	
105	Wasywich			55106 patients with first admission for heart failure	To examine the association between atrial fibrillation and congestive heart failure	Mortality	Heart failure severity	AF was not associated with an adverse prognosis
106	Huynh			282 elderly patients with heart failure	To identify independent predictors of long-term survival	Survival	Age Serum sodium Coronary arterial disease Dementia Peripheral vascular disease Systolic blood pressure Serum urea nitrogen	

	Author	Article	Design	Patients	Research question	Outcome	Variables	Recommendation
107	Maraldi			567 patients hospitalised heart failure patients	To evaluate the relationship of anaemia, physical disability and survival in patients with heart failure	Mortality	Anaemia	In women anaemia is associated with increased mortality
108	Jankowska			119 patients with stable heart failure	To investigate whether hyperuricaemia is of prognostic value on population with less advanced congestive heart failure	Prognosis	Hyperuricaemia	Also predicts exercise intolerance and inflammatory activation
109	Gibelin			159 patients with congestive heart failure	To evaluate the predictive value of elevated hyperhomocysteinemia in the prognosis of congestive heart failure	Mortality	Hyperhomocysteinemia	
110	Heidenreich			505 heart failure patients EF < 40%	To test the hypothesis if health status measure provides prognostic information	Prognosis	Health status measurement	Kansas City Cardiomyopathy Questionnaire Low score -> predictor for poor prognosis in outpatients with heart failure
111	Ahmed		Retrospective follow-up study	988 patients with heart failure EF >45%	To investigate the association between NYHA and outcome in patients with heart failure	Hospitalisation Mortality	NYHA II-IV	
112	Lee			5747 patients with heart failure NYHA II–III and EF < 45%	To evaluate the association between low blood pressure and prognosis	Mortality	Lower SBP Lower DBP	
113	Cacciatore		Follow up study	120 patients with CHF 1139 subjects without CHF	To examine the predictive role of frailty on long-term follow-up in elderly subjects with CHF	Mortality	Frailty	Frailty assessed by frailty staging system
114	Pocock			7599 patients with CHF	To develop prognostic models for patients with CHF	Mortality	Older age DM Lower left ventricular ejection fraction NYHA Cardiomegaly Prior HF hospitalisation Male BMI DBP	

	Author	Article	Design	Patients	Research question	Outcome	Variables	Recommendation
115	Feola		Observa-tional study	304 Patients with HF > 70 years	To analyse the relevance of BNP and echocardiography predicting cardiovascular events	Death Readmission for worsening heart failure	Age Plasma BNP Ejection fraction Urea nitrogen Serum creatinine NYHA	
116	Gardner			182 patients with advanced CHF	To compare the prognostic ability of NT-proBNP with Hb in patients with advanced heart failure	Mortality	NT-proBNP	NT-proBNP better prognostic marker than anaemia
117	Ekman			3029 patients with heart failure	To assess the relative importance of self-reported severity of symptoms as predictors of outcomes in CHF	Mortality	Breathlessness Orthopnoea Fatigue	
118	Maggioni			7421 patients	To confirm the prognostic role of anaemia patients with heart failure	Prognostic factor	Anaemia	
119	Ezekowitz			791 patients with CHF	To determine the association between anaemia and mortality	Mortality	Anaemia	Anaemia predicts mortality for men not for women
120	Jiang			291 patients hospitalised as a result cardiac event	To examine the relation among anxiety, depression and prognosis	Prognosis	Depression	Anxiety and depression are highly correlated in CHF patients, depression alone predicts a significantly worse prognosis

Table 3 – Descriptions of the included studies: Cancer

	Author	Article	Design	Patients	Research question	Outcome	Variables	Recommendation
121	Gripp	Article		n=216 referred patients for palliative radiotherapy	To study how survival of palliative cancer patients relates to subjective prediction of survival, objective prognostic factors and individual psychological coping	Prognosis	Estimation of physician Performance status Primary cancer Fatigue Dyspnoea Use of strong analgesics Anxiety	Physician survival estimations unreliable, especially in case of patients near death
122	Stone	Article	Review	Advanced cancer	To summarise the results of recent studies that have been attempted to improve upon or replace clinical estimation of survival	Survival	Clinician estimates of prognosis Prognostic score systems PaP score PPI CPS (Chang prognostic score) TCP Bruera's poor prognostic indicator	Overoptimistic PaP:30 day's survival probability best validated PPI: 6- week survival CPS: 2-week survival TCP: In adequately validated Bruera's: 4-week survival, small study
123	Lam	Article	Prospective cohort study	n=170 advanced cancer patients (in and out-patients enrolled into palliative care service	To identify potential prognostic factors affecting survival in patients with advanced cancer	Survival	Age Number of metastatic sites Serum albumin Karnofsky performance scale score Edmonton symptom assessment system score	Mean survival 77 days
124	Weissman	Fast fact				Prognosis	Karnofsky score In general: Metastatic solid cancer receiving no systematic chemotherapy (for whatever reason) -> prognosis < 6 months (except mammaca/prostate cancer with good performance status) Indicators survival less than 6 months: ascites, malignant pleural effusion, malignant bowel obstruction	

	Author	Article	Design	Patients	Research question	Outcome	Variables	Recommendation
10	Thomas	Document			Prognostic Indicator Guidance Revised Vs 5. Sept 08, a Guidance to enable better identification of patients who may need supportive/ palliative care	Palliative care	The surprise question Patient with advanced disease makes a choice for comfort care only Clinical indicators Cancer; any patient whose cancer is metastatic or not amenable for treatment. performance status, spending more than 50% of their time in bed	
125	Teunissen	Article			To assess the prognostic values of symptoms in hospitalised advanced cancer patients	Survival	Symptoms Headache Abdominal pain Anorexia Weight loss Nausea Vomiting Dysphagia Dyspnoea Drowsiness Confusion Depressed mood Karnofsky performance survival Gender	Mean survival 53 days Cluster of five prognostic symptoms increased the likely hood of dying
126	Maltoni	Article	Review	Advanced cancer patients	To offer evidence-based clinical recommendations concerning prognosis in advanced cancer patients Survival <90 days	Survival	Clinician 's prediction of survival Performance status Clinical symptoms Anorexia Weight loss Dysphagia Xerostomia Dyspnoea Delirium Biological factors Leucocytosis Lymfocytopenia CRP Prognostic scores	Survival <90 days

	Author	Article	Design	Patients	Research question	Outcome	Variables	Recommendation
127	Kikuchi	Journal article	Validation study	294 consecutive patients admitted to the Palliative Care Unit (PCU)	1) Which biological markers are associated with survival length in patients with advanced cancer? and 2) Could the accuracy of survival prediction be improved by addition of certain biological markers to performance status (PS) and physical symptoms, as compared with a survival model based on PS and physical symptoms alone?	Survival	Performance status Physical symptoms Fatigue Albumin Lactate dehydrogenase Lymphocyte percentage	Addition of ALB, LDH, and Lymp% to PS and physical symptoms improved prediction accuracy, especially for longer survival.
128	Wedding	Journal article		427 cancer patients, irrespective of age and type of cancer	Both co morbidity and functional impairment are associated with a shorter survival time in cancer patients, but their independent role has rarely been addressed before	Survival	Age Severe co morbidity, Functional impairment, Kind of tumour	
129	Wilner	Fast fact				Prognostic score	Dyspnoea Anorexia Karnofsky performance score Clinical prediction of survival (weeks) White bloodcel count Lymphocyte (%) Risk group 30-day survival	30 days Validated by Maltoni et al. for terminally ill cancer patients[130]
131	Allard	Journal article		1081 cancer patients admitted for terminal care	to assess the extent to which variables such as patient characteristics and primary tumour site affect the length of survival of terminally ill cancer patients	Survival	performance status gender living with a spouse cancer site	
132	Kelly	Journal article			The purpose of this study was to confirm the utility of the Vitamin B (12)/C-reactive protein Index in palliative care patients to be a prognostic factor	Prognostic factor	Vitamin B (12)/C-reactive protein Index	
133	Younis	Journal article			To investigate whether there is a difference in LOS in hospice between patients with cancer treated at a major cancer center compared to other practice settings	Length of survival	Performance status	

	Author	Article	Design	Patients	Research question	Outcome	Variables	Recommendation
134	De Miquel Sanchez	Journal article		98 patients	To determine which symptoms, signs, and characteristics that define the patient's functional status predict the survival time in terminally ill cancer patients	Survival	Palliative performance scale 135 Heart rate >100/min Respiratory rate >24/min	
136	Soares	Journal article	Prospec-tive cohort study	862 patients with cancer	To estimate the effects of age on 6-month survival of critically ill patients with cancer	Mortality	Age Organ failure Presence of uncontrolled cancer	
137	Bruera	Journal article	Prospec-tive study	61 patient with advanced cancer admitted to pallia-tive care unit	To estimate survival	Survival	Weight loss of 10 kg or more Cognitive failure Dysphagia	
138	Cheng	Journal article	Retrospec-tive study	240 consecutive patients with advanced cancer referred to the palliative care program	To investigate the interval between palliative care referral and death in patients with advanced cancer	Interval	Age Primary tumour	
139	Toscani	Journal article		601 randomly selected terminal cancer patients	To compare the relative prognostic power of clinical variables and quality-of-life (QoL) measures	Survival	Dyspnoea, cachexia, ADL, oliguria, dysphagia, dehydration, liver failure, acute kidney failure and delirium	In terminal cancer patients, clinical variables are better predictors of survival than QoL
140	Glare	Journal article		100 consecutive patients with advanced cancer hospitalised under the care of a medical or radia-tion oncologist	To evaluate the predictive accuracy of the Palliative Prognostic (PaP) score in patients with advanced cancer under the care of an oncologist		Palliative prognostic scale Dyspnoea Anorexia Karnofsky score Clinical Prediction of Survival (weeks) Total WBC Lymphocyte percentage	When oncologists' survival estimates are used, the PaP score is able to identify accurately three isoprognostic patient groups, irrespective of the cancer type
141	Viganó	Journal article		227 consecutive patients aged 18 years or older with terminal cancer of the lung, breast, and gastrointestinal tract	To establish the survival of patients with cancer after diagnosis of terminal disease and to determine the predictors of survival	Survival	Primary tumour of the lung (breast and gastrointestinal tract combined), liver metastases, moderate to-severe co morbidity levels (vs. absent-to-mild levels), weight loss of greater than 8.1 kg in the previous 6 months, serum albumin levels of less than 35 g/L, lymphocyte counts of less than 1 X 10(9)/L, serum lactate dehydrogenase levels of greater than 618 U/L, and clinical estima-tion of survival by the treating physician of less than 2 months (vs. 2-6 and >6 months).	
142	Hwang	Comparative study		429 metastatic cancer patients	To define survival prognostic groups	Survival	Karnofsky score Quality of life Symptoms	

	Author	Article	Design	Patients	Research question	Outcome	Variables	Recommendation
135	Wilner	Fast fact				Survival	Palliative performance scale Ambulation Activity level evidence of disease Self-care Intake Level of consciousness Estimated median survival in days	Found useful for purposes of identifying and tracking potential care needs of palliative care patients particularly as these needs change with disease progression Large validation studies are needed
143	Twomey	Article	Prospective study	N=221 patients admitted to the hospice (13 patients non malignancy)	To investigate the accuracy of prognostication by different health professional and to identify any demographic, diagnostic, or observational variables that might help to predict length of survival	Prognosis	Prediction of survival Number of admissions to the hospice Patient mobility at admission	Mean length of survival 20 days
144	Lau			831 patients admitted to palliative care unit Cancer 647 Non-cancer 86	This study investigates the use of PPS as a prognostication tool for estimating survival times of patients with life-limiting illness in a palliative care unit	Survival	Gender Age Palliative performance scale Ambulation Activity and evidence of disease Self-care Intake Conscious level	Study findings revealed that admission PPS score was a strong predictor of survival in patients already identified as palliative, along with gender and age, but diagnosis was not significantly related to survival
145	Walter	Original article	Data analyses derived from 2 prospective studies with 1-year of follow-up	Patients >70 years discharged from a general medical service at a tertiary care hospital (mean age, 81 years; 67% female) 1427 patients discharged from a separate community teaching hospital (mean age, 79 years; 61% female)	To develop and validate a prognostic index for 1 year mortality of older adults after hospital discharge using information readily available at discharge	1 year mortality	bivariable analyses (P <.20) Age of 80 years or older Male sex History of myocardial infarction, congestive heart failure, cerebrovascular disease, dementia, cancer, ADL function at discharge Length of hospital stay of more than 7 days, Discharge to a nursing home or skilled nursing facility, Creatinine level of 1.5 mg/dL or more albumin level of less than 4.0 g/dL multivariate analyses Male sex Congestive heart failure and cancer Functional dependency in any ADL at discharge, Creatinine level >3.0 mg/dL Albumin level ≥ 3.4 g/dL)	

Table 4 – Possible indicators after literature search

COPD	Indicator	Number of studies	Literature
1	Age	16	1,6,7,12,18,20,24,26,29,31,32,33,34,42,44,46
3	Level of dyspnoea	8	1,5,6,8,11,13,25,33
4	Peak VO_2 Low PaO_2	1 9	1 6,9,15,22,32,33,36,40,44
5	FEV1 <30% Other lung function parameters	15 6	1,4,6,7,9,10,11,12,15,24,25,31,34,44,46 20,30,31,32,45,47
6	Cor pulmonale Cardiovascular problems	10	1,8,9,10,11,15,16,7;22,48
7	Co-morbidity DM	7 1	4,10,19,20,24,29,48 20
8	Health status Exercise capacity (6 min walk distance) At best able to walk a few steps Bed to chair functional status ADL dependency Home care after discharge Being house bound Disability	5 9 2 1 1 1 1 2	1,5,7,12,20 1,5,6,10,12,25,28,35,45 9,11 15 22 22 4 2,47
9	Weight loss Low BMI Anorexia Fat-free mass index	8 14 1 2	1,7,8,9,11,17,20,29 4,6,12,19;24,25,31,34,36,38,39,40,45,47 10 38,42
10	Long term O_2 therapy	8	2,4,7,8,9,10,11,47
11	Readmission Hospital admission for a severe exacerbation (2-3 admissions in last year) Time elapsed since first hospitalisation Length of hospital stay	4 11 1 2	2,5,22,29 4,7,9,10,11,15,18,19,20;24,33 40 2,42
12	Depression	6	2,4,10,21,27,43
13	Low quality of life	4	2,4;24,48
14	Surprise question: would I be surprised if my patient were to die the next 12 months	3	4,7,10
15	Low self esteem	1	5
16	Fatigue Other symptoms	1 1	5 48
17	Frequent exacerbation	5	7,11,24,41,48
18	$PaCO_2$ Arterial blood gas	6 2	8,9,11,15,18,35 1,31
19	Unresponsive to bronchodilators	2	9,11
20	Resting tachycardia >100	2	9, 11
21	Patient makes a choice for comfort care	1	10
22	>6 weeks of systematic steroids for COPD in the preceding 12 months Oral corticosteroid use	2 1	10,18 39
23	Polycythemia	1	15
24	Albumin	3	22,35,40
25	Sexe	4	24,26,36,42
26	Care of professional(s)	2	26,29
27	Haemoglobin	1	31
28	CRP	1	37
29	Midthigh muscle cross sectional area Quadriceps strength	2 1	1,14 34

Cancer	Indicator	Number of studies	Literature
1	Performance status Karnofsky performance status Self–care Patient mobility at admission Ambulation Activity of daily living	6 7 1 1 1 1	121,127,128,131,133 123,124,10,125,129,140,142 135 143 135 139
2	Fatigue	2	121,127
3	Headache	1	125
4	Abdominal pain	1	125
5	Anorexia Weight loss intake	4 4 1	125,126,129,140 125,126,137,141 135
6	Nausea	1	125
7	Vomiting	1	125
8	Dysphagia	4	125,126,137,139
9	Xerostomia	1	126
10	Drowsiness Level of consciousness	1 1	125 135
11	Confusion	1	125
12	Delirium	2	126,139
13	Depression	1	121
14	Anxiety	1	121
15	Dyspnoea	6	121,125,126,129,139,140
16	Use of strong analgesics	1	121
17	Brain metastases Number of metastatic sites Metastatic solid cancer receiving no systematic chemotherapy Cancer which is metastatic or not amenable for treatment Liver metastases	1 1 1 2 1	121 123 124 10,136 141
18	Leucocytosis	4	121,126,129,140
19	Lymfocytopenia Lymphocyte percentage	3 2	126,129,141 127,140
20	Lactate dehydrogenase	3	121,127,141
21	CRP Vitamin B(12)/C reactive protein Index	1 1	126 132
22	Age	5	123,125,128,136,138
23	Serum albumin	3	123,127,141
24	Edmonton symptom assessment symptom score Physical symptoms	1 2	123 127,142
25	Kind of tumour	4	128;131,138,141
26	Ascites	1	124
27	Patient with advanced disease makes a choice for comfort care only	1	10
28	Gender	2	125,131
29	Clinician's prediction of survival Estimated median survival in days Estimation of the physician Surprise question: would I be surprised if my patient were to die the next 12 months?	5 1 1 1	126,129,143,140,141 135 121 10
30	Activity level of disease evidence Malignant pleural effusion Malignant bowel obstruction	1 1 1	135 124 124
31	Number of admissions to the hospice	1	143
32	Living with a spouse	1	131
33	Heart rate >100/min	1	134
34	Respiratory rate >24/min	1	134
35	Quality of life	1	142

CHF	Indicator	Number of studies	Literature
1	Gender	13	49,52,54,60,65,68,74,75,77,78,96,102,114
2	Age	21	49,50,52,54,1,58,60,65,67,68,72,74,75,77,93,97,99,102,106,114,115
3	BNP	11	50,60,65,67,72,84,89,92,93,115,116
4	LVEF LVEF <20% LVEF <30% LVEF <40%	17 6 1 1	50,51,52,53,56,59,60,65,67,68,72,76,77,84,93,114,115 56,8,22,9,15,11 75 1
5	Peak O_2 consumption	6	50,51,52,56,76,78
6	Medicine: ACE, B-blocker, spironolacton Medicine: isosorbidedinitraat, antiarrhytmica, statine Optimally treated including afterload reduction	5 1 3	50,60,68,75,77 15 56,9,11
7	NYHA NYHA IV NYHA III-IV	10 5 4	51,54,67,68,74,92,105,111,114,115 56,9,61,72,11 15,77,10,97
8	Complex ventricular rhythm Arrhythmia Dysrrhythmia, therapy resistant Atrial fibrillation Permanent pacemaker	3 1 1 3 2	22,1,11 8 59 77,93,97 52,68
9	Discharge from hospital Readmission within 2 months Recent cardiac hospitalisation Hospitalisation Frequent ER visits for symptoms Hours of hospital presentation 2-3 acute care admits for HF in the past year	1 1 3 7 3 1 1	49 22 54,59,77 56,15,65,78,88,99,114 56,8;10 67 9
10	Activities of daily living dependency >3 Reduced functional capacity Exercise capacity (6 min walk test) Karnofsky score <50% Disability score Homecare after discharge Worse health related quality of life Health status Frailty (frailty staging system)	1 2 5 1 1 1 1 3 1	22 59,67 53,51,60,76,95 56 76 22 69 76,98,110 113
11	Weight loss of 2.3 kg or more within 3 months Loss >10% body weight Low BMI Cachexia	1 2 7 2	22 56,78 60,65,76,93,94,101,114 59,67
12	Albumin Albumin level <20%	1 1	65 22
13	Anaemia	15	58,59,60,65,67,68,75,77,90,93,97,104,107,118,119
14	Hyponatremia	12	51,52,57,58,59,65,67,68,75,76,77,106
15	Troponine	1	65
16	Systolic blood pressure	19	54,56,57,1,58,59,15,65,67,68,75,76,77,78;79,102,106,112,114
17	Respiratory rate	3	58,65,67
18	Co-morbidity (DM, MI, COPD, dementia, HIV, peripheral arterial disease, cardiac arrest, syncope, CVA)	17	52,57,8,58,59,67,72,74,75,77,78,11,91,97,99,106,114

CHF	Indicator	Number of studies	Literature
19	Dyspnoea at rest Symptoms of heart failure Orthopnoea Self perceived symptoms Physical symptoms despite optimal therapy Fatigue	3 2 2 1 1 1	8,15 ,117 76,11 60,117 60 11 117
20	Higher heart rate	7	54,56,60,65,75,76,78
21	Renal failure Creatinine Urea nitrogen concentration Erythropoietin level	9 8 12 2	56,67,72,73,78,87,93,97,102 54,60,65,68,75,77,67,115 57,58,59,67,75,77,86,99,103,106,108,115 80,85
22	Ischemic aetiology Cause of heart failure Severe valvular disease Cardiomyopathie	4 1 1 3	56,68,72,106 76 77 52,53,114
23	Insurance Social economic situation Minority of ethnic group Race Living alone	1 1 1 1 1	65 74 72 65 74
24	Depression Depression/Anxiety Psychological symptoms despite optimal tolerated therapy	7 1 1	67,74,78,82,83,100,120 76 10
25	No adherence to medication	1	73
26	Surprise question: would I be surprised if my patient were to die the next 12 months	2	54,10
27	Cardiac norephinephrine spill over Plasma norepinephrine level	2 1	50,67 67

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3 Early identification of and proactive palliative care for patients in general practice, incentive and methods of a randomised controlled trial

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BMC Fam Pract. 2011 Nov 3;12:123

Abstract

Background

According to the World Health Organisation, patients who can benefit from palliative care should be identified earlier to enable proactive palliative care. Up to now, this is not common practice and has hardly been addressed in scientific literature. Still, palliative care is limited to the terminal phase and restricted to patients with cancer. Therefore, we trained general practitioners (GPs) in identifying palliative patients in an earlier phase of their disease trajectory and in delivering structured proactive palliative care. The aim of our study is to determine if this training, in combination with consulting an expert in palliative care regarding each palliative patient's tailored care plan, can improve different aspects of the quality of the remaining life of patients with severe chronic diseases such as chronic obstructive pulmonary disease, congestive heart failure and cancer.

Methods/Design

A two-armed randomised controlled trial was performed. As outcome variables we studied: place of death, number of hospital admissions and number of GP out of hours contacts.

Discussion

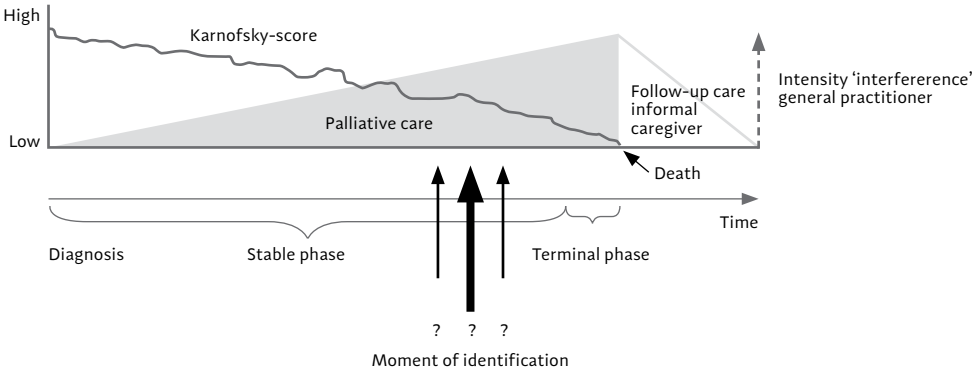
We expect that this study will increase the number of identified palliative care patients and improve different aspects of quality of palliative care. This is of importance to improve palliative care for patients with COPD, CHF and cancer and their informal caregivers, and to empower the GP. The study protocol is described and possible strengths and weaknesses and possible consequences have been outlined. The Netherlands National Trial Register: NTR2815

BACKGROUND

According to the World Health Organisation (WHO) palliative care is 'an approach that improves the quality of life of patients and their families facing the problems associated with life-threatening illness, through the prevention and relief of suffering by means of early identification and impeccable assessment and treatment of pain and other problems, physical, psychosocial and spiritual'.[1] A first challenge evoked by this definition is the early identification of a patient who may benefit from palliative care. Although the WHO-recommendations have been accepted worldwide, no scientific papers have been published yet on how to identify patients who could potentially benefit from an earlier start of a palliative care in general practice. A literature review of Qaseem *et al*. did not identify any validated tools that predict the optimal timing to initiate palliative care services in general practice,[2] despite the fact that a lot of research has been undertaken to elucidate the prediction of mortality, survival, and prognostication for patients with advanced cancer and non-cancer diseases.[3-10] For patients not recognised as being in a palliative phase an individualised well-considered plan of action is missing [11,12]

Several illness trajectories have been described for people with progressive chronic illnesses.[13,14] For none of these trajectories the right moment to start palliative care has been defined yet. Particularly regarding patients with non-malignant diseases, such as advanced chronic obstructive pulmonary disease (COPD) and congestive heart failure (CHF), recognising or defining the moment when palliative care should be taken in consideration seems difficult (Figure 1).[15,16] In a national questionnaire among multiple palliative care providers the lack of prognostic indicators and clinical triggers for starting end-of-life care appeared to be the most important missing link in applying palliative care in primary care.[17] By integrating palliative care into curative care practices or combining palliative care with disease-

Figure 1 - What is the moment to start palliative care? a modified figure of Lynn and Adamson[59]



oriented management earlier in the disease trajectory, chronically ill patients nearing the end of life reported improved satisfaction with care and demonstrated less acute interventions and were more likely to die at home.[18,19]

The second challenge in bringing the WHO definition into clinical practice, for which early identification is a prerequisite, is a structured proactive palliative care planning. Palliative care programs appeared to reduce symptom distress and improve patient and family satisfaction. Important elements of structured proactive palliative care proved to be coaching the patient to make choices regarding future interventions or restrictions,[20-22] consulting caregivers,[18] eliciting values and addressing the psychological , existential and social context of patient and informal caregiver.[23,24] By proactive planning death at home could be enhanced,[25-27] the number of unforeseen transfers decreased,[28] hospital lengths of stay and aggressive interventions diminished and consequently costs and utilisation decreased.[28-30]

For GPs a structured proactive palliative care planning is a challenge, as patients with an advanced chronic disease are often under supporting care of the disease-specific specialists until far in the disease trajectory.[31] The GPs should pick up their role as coordinator of palliative care against the mainstream of disease-oriented interventions.[32,33] Several studies concluded that when a GP is part of a team, palliative care improves on different aspects; for patient, informal carer and the participating GP.[34,35]

AIMS OF THE STUDY

Research questions

In this study we aim to answer the following questions:
Does early identification and proactive palliative care planning of palliative patients by the GP influence

1. Place of death, number of transitions and number of contacts with the out of hours primary care service?
2. Quality of life of patients and their informal caregivers and prescriptions?
3. GP satisfaction with the delivered palliative care and their own assessment of their ability to provide palliative care?

The objective of this report is to present the study protocol used for the data collection in 2009 and 2010. We describe the protocol of the study, provide a description of the intervention, the methodology and the baseline characteristics of the participating GPs. The described methodology will also serve as a reference for future publications about this study.

METHODS/DESIGN

Study design

We performed a two-armed randomised controlled trial.

We studied the following hypothesis: H_0: training GPs in early identification of palliative care patients and proactive care planning will not increase the percentage of patients that die at home, will not reduce the amount of hospital admissions and will not reduce the number of contacts with the out of hours primary care service. This hypothesis will be rejected if the training has a significant positive effect on these aspects of care.

Power calculation

Sample size was based on number of contacts with the out of hours primary care service. To detect a difference between the intervention and the control group with a power of 80% and an alpha error of 0.05 minimum sample size was 96 patients in both groups when 20% reduction in out of hours contacts was considered.

Participants

GPs in two comprehensive cancer centre (IKO and IKZ) regions in the South-East of the Netherlands were invited by mail to participate in the study. After one month a reminder was send to non-responders. Excluded were GPs who are consultant in palliative care or who are locum. GPs that wanted to participate were stratified for degree of urbanisation and working hours (part-time or full-time) and were randomised assigned to the intervention or the control condition by an independent statistician. To prevent contamination, those GPs working together in the same practice were placed in the same study group.

Ethical considerations

The study was conducted after approval of the research ethics committee of the Radboud University Nijmegen Medical Center in accordance with the Medical Research Involving Human Subjects Acts (WMO). Patient and physician anonymity was guaranteed throughout the registration and data entry process. Patients and their informal caregiver were invited to participate by their GP. If they agreed to participate in the longitudinal study they received a patient information letter and an informed consent form. Trial registration has been obtained. (The Netherlands National Trial Register: NTR2815)

The intervention

The intervention for the GPs in the experimental condition consisted of three consecutive parts.

Table 1 – The RADboud indicators for PAlliative Care needs (RADPAC)

Congestive Heart Failure	1. The patient has severe limitations, experiences symptoms even while at rest. Mostly bedbound patients. (NYHA IV) 2. There were frequent hospital admissions (>3 per year) 3. The patient has frequent exacerbations of severe heart failure (>3 per year) 4. The patient is moderately disabled; dependent. Requires considerable assistance and frequent care (Karnofsky score ≤50%) 5. The patient's weight increases and fails to respond to increased dose of diuretics 6. General deterioration of the clinical situation (oedema, orthopnoea, nycturia, dyspnoea) 7. The patient mentions 'end of life approaching'
Chronic Obstructive Pulmonary Disease	1. The patient is moderately disabled; dependent. Requires considerable assistance and frequent care (Karnofsky score ≤50%) 2. The patient has substantial weight loss (±10% loss of bodyweight in six months) 3. The presence of congestive heart failure 4. The patient has orthopnoea 5. The patient mentions 'end of life approaching' 6. There are objective signs of serious dyspnoea (decreased dyspnoea d' effort, dyspnoea with speaking, use of respiratory assistant muscles and orthopnoea)
Cancer	1. Patient has a primary tumour with a poor prognosis 2. Patient is moderately disabled; dependent. Requires considerable assistance and frequent care (Karnofsky score ≤50%) 3. There is a progressive decline in physical functioning 4. The patient is progressively bedridden 5. The patient has a diminished food intake 6. The presence of progressive weight loss 7. The presence of the anorexia-cachexia syndrome (lack of appetite, general weakness, emaciating, muscular atrophy) 8. The patient has a diminished 'drive to live'

Part one consisted of a five-hours training in early identification of palliative patients and proactive care planning. This training was provided by two experienced GPs with a specialization in palliative care and an extended experience in teaching. Early identification was based on two tools, developed in an earlier stage of the project and described elsewhere.[36] The first tool is a plasticised card (Table 1) with indicators to identify and recognise patients with respectively COPD, CHF and cancer as being in a stage that palliative care should be considered, the so-called 'Radboud Indicators Palliative Care needs' (RADPAC). GPs were trained in 1) checking actual problems of the patient in a structured way at the moment of identification, 2) considering potential problems that could be expected in the (near) future and 3) foretelling the most likely scenarios on deterioration and death. A previously developed tool (Table 2) could be used as an abstract of the content of the training and could be used to structure the discussion with the patient and their informal caregiver, and to explore their actual and potential problems and needs (Proactive Palliative Care Planning Card (PPCPC)). The aim was a shared proactive policy to deliver specific, proper and individualised palliative care planning.

Table 2 - Reminder for proactive planning and disease specific potential problems (Proactive Palliative Care Planning Card, PPCPC).

Somatic domain		**Social en financial domain**	
Action plan		Action plan	
Actual problems:		Actual problems :	
Expected problems: Scenario of dying:		Expected problems:	
Care provision and activity of daily living		**Existential and psychological domain**	
Action plan		Action plan	
Actual problems:		Actual problems:	
Expected problems:		Expected problems:	
Possible future problems Pain Dyspnoea Ileus Delirium Fear Depression Coma Liver/renal failure Strain of informal caregiver Special technical care			
Disease specific interest CHF : anaemia deactivation defibrillator weight COPD: medical /non-medical possibilities against dyspnoea			

The second part of the intervention consisted of a coaching session for the GPs with a physician specialised in palliative care regarding each identified patient included in the study. In this session the GP received feedback and suggestions on the proposed proactive palliative care plan, potential future problems and potential scenarios of deterioration and death.

The third part of the intervention consisted of two peer group sessions of the intervention GPs, eight and ten months after the initial training session. In these sessions the main focus was patient-GP communication techniques regarding having the first conversation with the patient about palliative care (and thus about end-of-life issues). GPs also had the opportunity to exchange experiences on this topic. Data for process description were collected during the first year after T0. Effect evaluation took place in April 2011.

Control group

GPs in the control group were asked to provide usual care. They were not trained and had no access to RADPAC, nor to the PPCPC. Consultation by telephone with the palliative care

helpdesk of the Comprehensive Cancer Centre was possible as usual. This service is available 24/7 for all GPs in the two comprehensive cancer centres regions in the South-East of the Netherlands; mostly these consultations are on problems in the terminal phase for which the GP needs specialised advice for acute problems. For GPs in the control group a training will be organised after the intervention study is closed.

Data collection

At the start of the study (t=1), GPs in the intervention group were asked to use RADPAC to screen the medical records of all patients in their practice to identify patients with COPD, CHF or cancer who potentially could benefit from a palliative care approach. They were instructed to continue to use RADPAC each time new data of a patient with CHF, COPD or progressive cancer was available. In 2011, anonymous data were collected retrospectively from the medical records of all patients that had a non-acute death during the intervention period, as well in the intervention as in the control practices (t=2). All deceased patients who were diagnosed with CHF, COPD and/or cancer were included (Figure 2). Each non-planned (out of hour) contact and hospital or nursing home admission during the study was derived from the medical record and registered as well as place of death and if the patient had been identified as being in the palliative trajectory. Besides, qualitative data were collected concerning proactive care planning in both study groups.

Outcomes

GPs of both study groups were invited to extract data of all patients that died during the observational period from the medical records: demographics, disease history, place of death, hospital admissions and out of hours consultations. Of each participating GP, demographic characteristics, practice characteristics and their interest in palliative care were collected (Table 3).

Figure 2 – Study design randomised controlled trial

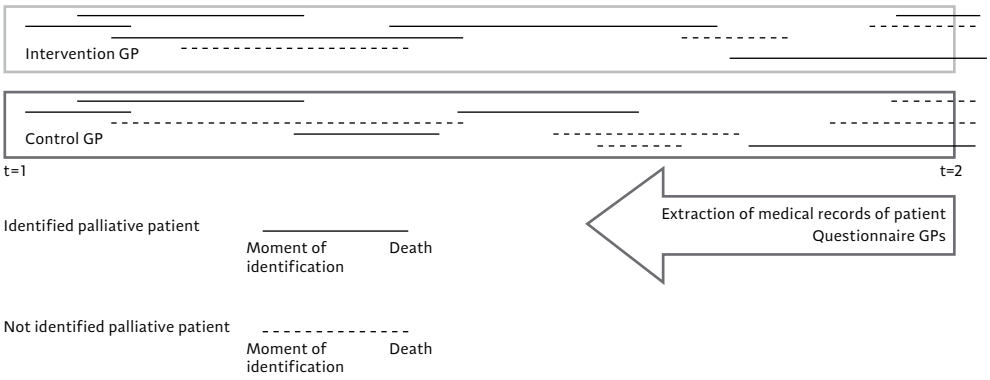


Table 3 - Baseline characteristics participating GPs# (n=133)

Characteristics of general practitioners	
Age – yr	48,2 ± 8,1
Gender male sex – no. (%)	81 (60,9)
Working week fulltime – no. (%)	70 (52,6)
Experience – no. (%)	
≤ 1 year	2 (1,5)
2 - 5 years	14 (10,5)
6 - 10 years	21 (15,8)
≥ 10 years	94 (70,7)
Missing	2 (1,5)
Interest in palliative care*	8,14 ± 1,12
Missing	3
Estimation of own capability**	6,83 ± 0,92
Missing	3
Characteristics of practice	
Practice form – no. (%)	
Single-handed	28 (21,1)
Dual	53 (39,8)
Group and health centres	52 (39,1)
Missing	0
Degree of urbanisation – no. (%)	
Very	46 (34,6)
Moderate	28 (21,1)
Less	41 (30,8)
No	18 (13,5)
Missing	0
Size of practice Fte-average practice+	1728 ± 409
Missing	1
Palliative care	
Palliative patients/y – no. (%)	
≤ 2 patients	10 (7,5)
3 - 5 patients	72 (54,1)
5 - 9 patients	43 (32,3)
≥ 10 patients	6 (4,5)
Missing	2 (1,5)
Use of consultant palliative care – no. (%)	
Yes	105 (78,9)
No	25 (18,8)
Missing	3 (2,3)

Plus-minus values are means ±SD.
+ Size of practice = fulltime-equivalent/average practice (= 2350 patients).
* Interest in palliative care, visual analogue scale, rang 0, indicating no interest, to 10 very much interest.
** Estimation of own capability, visual analogue scale, rang 0, indicating not capable, to 10 very much-capable.

Data management and plan of statistical analysis

All data were entered in a database and analysed with SPSS 16.0. In both study groups, all patients who died during the inclusion and observation period of the study of a non-acute death, were included in the retrospective analysis. Intervention and control group will be compared on the main outcomes (place of death, number of transitions and out of hours contact, amount of identified patients). Recruitment rates and drop-out rates will be calculated. In case denominators prove to be significantly correlated with the outcome of the main study question, an Anova will be performed to identify potential related or independent factors. Multilevel analysis will be performed.

DISCUSSION

The present study has been designed to assess the effects of training GPs in early identification and a proactive palliative care approach regarding patients with COPD, CHF or cancer.

Strengths

Up to now, hardly any data are available about implementing the 2002 WHO-definition for palliative care. To our knowledge this is the first intention to treat RCT that assesses the effect of training GPs in early identification and using a proactive holistic palliative care approach, which are the main aspects of this definition. The training for the GPs in the intervention group was standardized and piloted, to minimize differences between the two trainers and to be available for future courses. The tools that the GPs in the intervention group could use for helping to identify palliative patients in an earlier stage than usual and to structure the proactive care planning, were developed in a scientifically sound way. Results will be published in peer-reviewed scientific journals and will be communicated to relevant clinician associations.

Weaknesses

Those GPs that were interested to take part in the study, probably have a special interest in palliative care. Besides, as there is a lot of attention for proactive palliative care in medical journals and in Dutch policy, GPs in the control group might be influenced by new information or followed courses. This implies that it might be difficult to find significant differences between intervention and control group. As patients were identified by their own GP, we were not able to influence this process directly.

We did not choose to collect prospective patient data in the control group, as this would be a sort of intervention. Therefore, effect measurement took place retrospectively. GPs in both intervention and control group were asked to collect retrospective data from their digital patient information system. This implies that we do not have patient data of non-responding GPs.

We performed a multifaceted intervention: a combination of training GPs and offering them tools to facilitate early identification and proactive care planning. Usually, multifaceted interventions are more effective than single interventions,[37] but the relative impact of each component of the intervention cannot be established.

CONCLUSION

The present study will increase the knowledge about the effect of training GPs in early identification and a proactive palliative care approach. This knowledge is of importance to improve palliative care for patients with COPD, CHF and cancer and their informal caregivers, as well as to empower the GP. Here, the study protocol is described and possible strengths and weaknesses and possible consequences have been outlined.

ACKNOWLEDGEMENTS

This project was financially supported by a grant of the Netherlands Organisation for Health Research and Development-ZonMw, The Hague. Project number: 1150.0002

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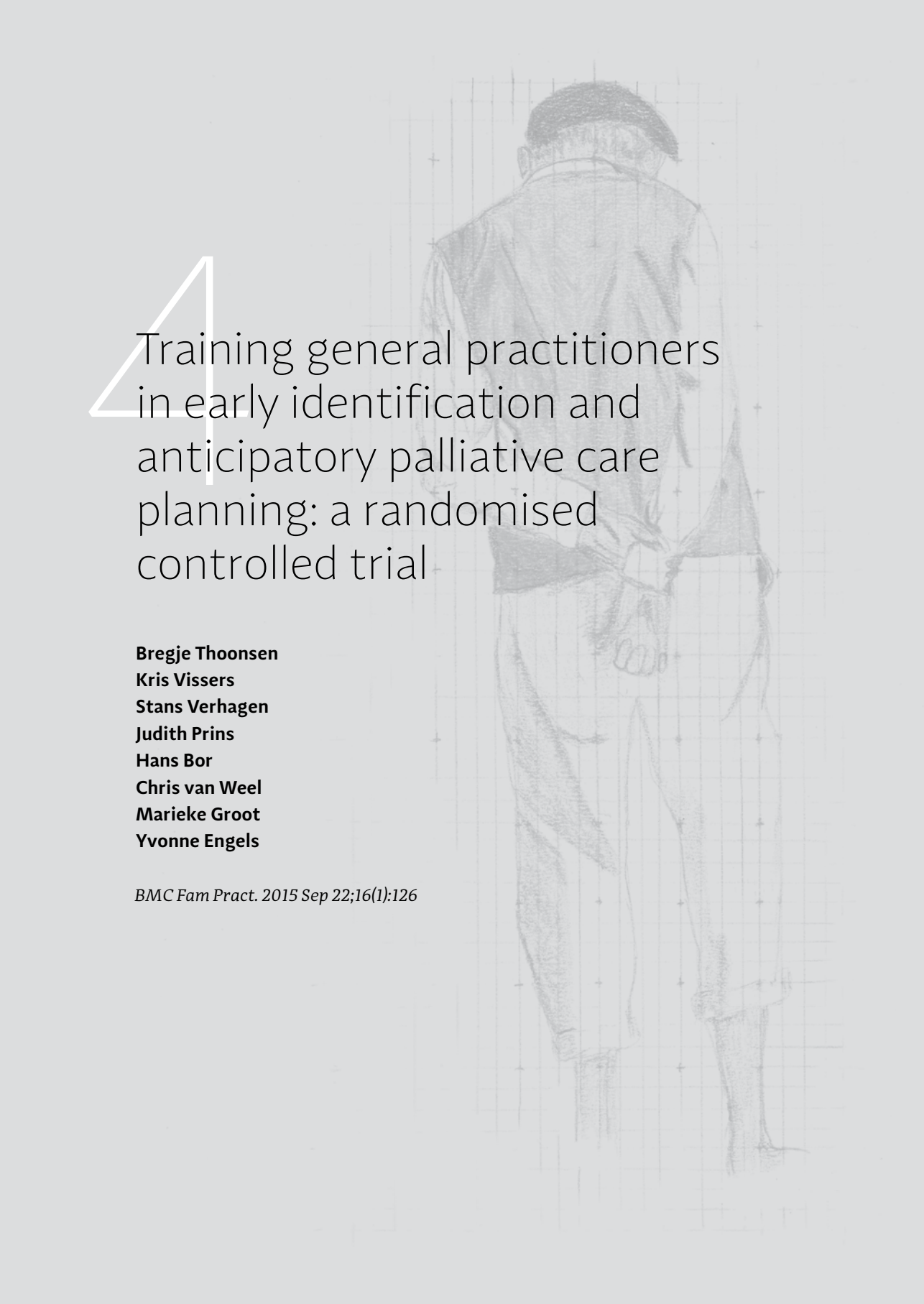

4 Training general practitioners in early identification and anticipatory palliative care planning: a randomised controlled trial

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BMC Fam Pract. 2015 Sep 22;16(1):126

Abstract

Background

Most patients with advanced cancer, debilitating COPD or congestive heart failure (CHF) live at home. General practitioners (GPs) asked for guidance in how to recognise patients in need of palliative care in a timely way and to structure anticipatory care. For that reason, we developed a training for GPs in identifying patients in need of palliative care and in structuring anticipatory palliative care planning and studied its effect on out-of-hours contacts, contacts with their own GP, hospitalisations and place of death.

Methods

We performed a cluster randomised controlled trial. GPs in the intervention group were trained in identifying patients in need of palliative care and anticipatory care planning. Next, for each identified patient, they were offered a coaching session with a specialist in palliative care to fine-tune a structured care plan. The GPs in the control group did not receive training or coaching, and were asked to provide care as usual.

After one year, characteristics of patients deceased of cancer, COPD or CHF in both study groups were compared with mixed effects models for out-of-hours contacts (primary outcome), contacts with their own GP, place of death and hospitalisations in the last months of their life (secondary outcomes). As a post-hoc analysis, of identified patients (of the intervention GPs) these figures were compared to all other deceased patients, who had not been identified as in need of palliative care.

Results

We did not find any differences between the intervention and control group. Yet, only half of the trained GPs (28) identified patients (52), which was only 24% of the deceased patients. Those identified patients had significantly more contacts with their own GP (B 4.5218; $p < 0.0006$), were less often hospitalised (OR 0.485; p 0.0437) more often died at home (OR 2.126; p 0.0572) and less often died in the hospital (OR 0.380; p 0.0449).

Conclusions

Although we did not find differences between the intervention and control group, we found in a post-hoc analysis that those patients that had been identified as in need of palliative care had more contacts with their GP, less hospitalisations, and more often died at home. We recommend future controlled studies that try to further increase identification of patients eligible for anticipatory palliative care.

BACKGROUND

In developed countries cancer, cardiovascular diseases and respiratory diseases are the main causes of death.[1,2] Each year, in the Netherlands, about 140,000 persons die and two third of them die non-acutely of one of these three diseases.[3] Particularly in advanced stages of these diseases, symptom burden is high.[4-6]

In order to improve the care for patients with incurable, life-limiting diseases, the WHO stated in 2002 that palliative care should be initiated in an early phase of the disease. A timely start facilitates anticipatory care planning in order to meet patient wishes and needs, to relieve symptoms and to prevent future symptoms and problems. Regardless of the WHO recommendation, palliative care is often restricted to a reactive approach and to the relief of physical symptoms in the terminal phase, often resulting in emergency visits by the general practitioner (GP),[7] unplanned transfers[8,9] and hospital admissions.[10,11] Consequently, too many patients die in another place than preferred, often with ineffective, costly and unwanted interventions.[12-14]

Anticipatory care planning by earlier identification of the needs of patients in an advanced stage of their disease appeared to improve the quality of their remaining life, to decrease the number of aggressive futile interventions and depressed mood and even to prolong life in patients with advanced cancer.[15-17]

Identification of patients who can benefit from anticipatory palliative care alongside or instead of disease-oriented therapies, is challenging particularly in patients with chronic obstructive pulmonary disease (COPD) or congestive heart failure (CHF), due to the fact that the course of these disease trajectories is difficult to predict.[18-22] In addition, these patients often don't realise that they have a limited life expectancy.[23] In order to facilitate the identification of patients at risk of deterioration or dying, and thus for anticipatory palliative care, several sets of indicators have been developed, such as the Supportive and Palliative Care Indicators Tool (SPICT) in Scotland, the Prognostic Indicator Guide (PIG) in England, Neccesidades palliativas (NECPAL) in Spain and the Radboud indicators for Palliative Care needs (RADPAC) in the Netherlands.[24] These tools contain general or disease-specific indicators of decline. Examples of these indicators are repeated hospital admissions, weight loss, decrease in functional status, and the surprise question (*Would you be surprised if this patient were to die in the next twelve months?*).

In the Netherlands patients are registered with a doctor's general practice, as part of their health care insurance. This structures a relation with a personal GP, who provides care for the large majority of their health problems presented and is the gatekeeper to specialist and hospital care. Through this structure, GPs have an overview and often intimate knowledge

of the patient and his/her health conditions and social environment. This primary care-based structure plays an important role in coordinating early palliative care. GPs consider palliative care an attractive and essential part of their task, but experience difficulties with timely initiation and their coordinating role in palliative care.[25,26]

For those reasons, we developed a training for GPs in using a previously developed set of identification indicators, the RADPAC,[27] in planning and providing structured anticipatory palliative care and in communicating end-of-life issues with the patient. We expected that this training would improve the care for palliative patients with cancer, COPD or CHF in the form of less contacts with the out-of-hours hours primary care cooperative, a decreased number of hospitalisations in the last three months of life, an increased number of contacts with their own GP in the last month of life and an increased number of patients that would die at home. We tested this in a cluster randomised controlled trial (RCT).

METHODS

Design

A clustered, two-armed RCT was performed, with the GP as cluster. The study ran from February 2009 until February 2011.

Participants

All GP practices in two regions of the comprehensive cancer centres of the Netherlands were invited by mail to participate. GPs were excluded if they were a consultant in a palliative care team. Participating GPs were stratified for working hours (part-time or full-time) and for degree of urbanisation of their general practice (urban or rural) and they were randomly assigned to the intervention or control group by an independent statistician. To prevent contamination, GPs working together in the same practice were allocated to the same study group. Borland C software was used to randomly allocate GPs, as sequentially numbered containers, to the strata of one of both groups.

Intervention

The intervention, described in detail elsewhere,[28] consisted of three consecutive parts: 1. a five hour group training in early identification of those patients in their practice that can be considered as being palliative patients, by means of the RADPAC,[27] and in proactive care planning, 2. an individual coaching session by phone with a physician specialised in palliative care, per identified palliative patient for the GP and 3. two additional peer group sessions with the GPs in the intervention group a few months after start of the intervention, with a focus on patient – GP communication regarding the initiation of a palliative care

trajectory. The GPs in the intervention group were invited to use the RADPAC indicators to screen the medical records of all persons in their practice to identify those patients with CHF, COPD or cancer who potentially could benefit from a palliative care approach. They were also asked to use this screening instrument whenever new data of any patient with one of these three diseases became available, in order to timely identify the change from a curative to a palliative trajectory. They were asked to consider and start structured anticipatory palliative care for every identified patient. The GPs discussed palliative care and the study with the patient, and provided him or her a brochure with information about palliative care, the content of the study and what participation would imply for the patient.

GPs in the control group were asked to provide care as usual. Although this usual care differs per GP, they all have easy access to a large number of palliative care standards,[29] and each physician and nurse in the Netherlands can consult a specialist in palliative care 24/7 by phone.[30]

Data collection

At baseline, demographics and practice characteristics of each participating GP were collected, as well as their interest in palliative care (on a numeric rating scale (NRS) from 0, not interested at all to 10, extremely interested) and their confidence in providing palliative care by themselves (NRS from 0, not confident at all to 10, extremely confident).

If the patient was interested to participate, the GP asked him or her to sign an informed consent form, which was faxed to the researcher, together with a questionnaire with characteristics of the patient. The consulted palliative care specialists were asked to register each coaching session that they had with the GPs.

After 12 months, GPs that had not yet identified any patients for proactive palliative care were phoned by the research assistant and were asked in the form of an open question what the reason for non-inclusion was.

One year after start of the study, a questionnaire was sent to each GP in as well the intervention as the control group. They were asked to provide anonymous data, collected from the medical records of all patients that died in the past 12 months. This data included whether or not the patient died a sudden death, cause of death, age, gender, number and type of contacts with the GP out-of-hours service (by phone, consultation at the service, home visit) in the last three months before death, number and type of contacts with their own GP in the last month before death (phone calls and home visits during office hours and phone calls and home visits during out of office hours), place of death and number of hospital admissions in the last three months of life. Regarding out-of-hours contacts and contact with

their own GP we chose a limited period of respectively one and three months before death, as we considered this a feasible period to check the electronic medical record, and as such contacts are most frequent near the end of life.

Statistical analyses

The primary outcome measure was the number of contacts with the out-of-hours GP cooperative. We estimated that with 96 patients in each group, the study would have an 80% power to detect a significance between the intervention and control group, which would be a 20% reduction of out-of-hours contact.[28]

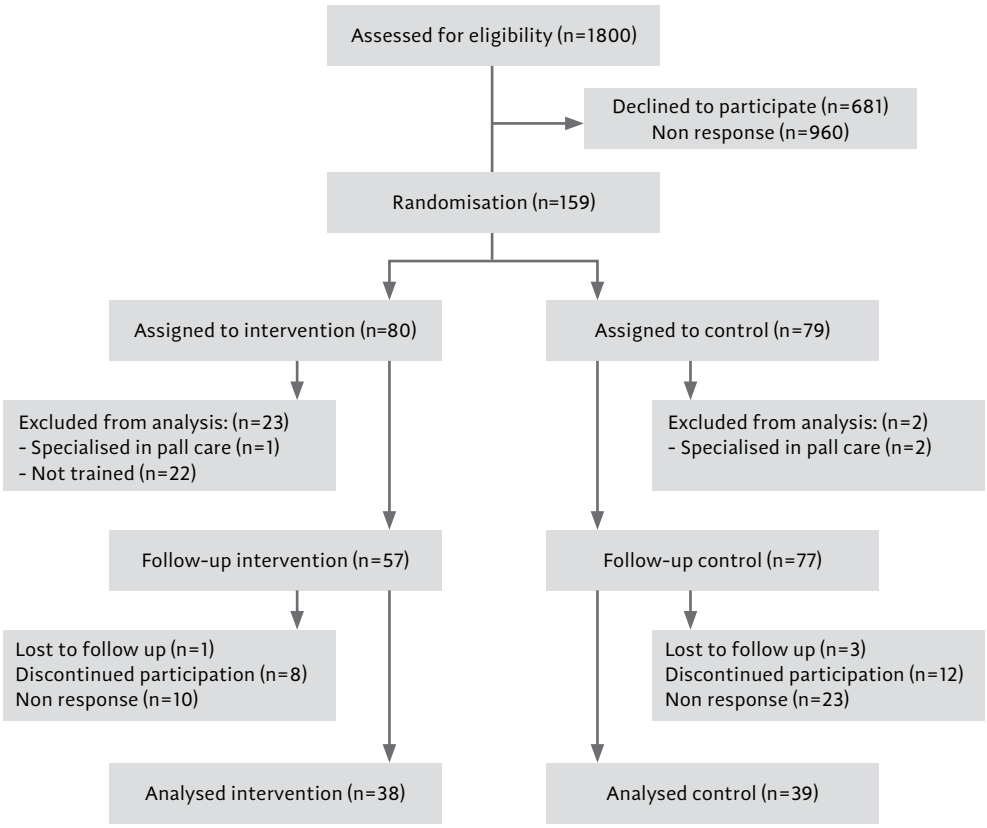
Statistical analysis was performed with the use of SPSS software, version 20.0 and with SAS software, version 9.2. Descriptive statistics were used to calculate frequencies, means, and standard deviations of the study variables. Differences between GPs in baseline characteristics were assessed with the use of chi-square tests for categorical variables and Student's t-tests for continuous variables. To study differences, between deceased patients in both study groups, mixed effects models were used (SAS GLIMMIX), with the GP as a cluster. In this model, the type of disease the patient died of, the age of the GP, working hours, interest in palliative care, and estimation of the GP's own capacity were included in the model as possible confounders.

It appeared that only a portion of the deceased patients had actually been identified as in need of palliative care in the intervention group. Therefore we performed a post-hoc analysis. We also used the same model to study differences between those patients that had been identified as in need of palliative care by GPs in the intervention group, and all other deceased patients (in as well the control and the intervention group).

RESULTS

Within a period of one month, 159 GPs positively responded to the invitation to participate. (Figure 1) After stratification, they were randomly assigned to the intervention (n=80) or control group (n=79). For various reasons, 22 GPs in the intervention group were not able to join the training course. A majority of these 22 GPs worked fulltime (60%), had slightly less years of experience (20% had 0-5 years), worked in a group or health centre (50%), and had a larger patient list (2684 patients). Yet, the estimated number of palliative patients in this group was lower (only 23.8% estimated to have 5 or more palliative patients per year). Additionally, one GP from the intervention group and 2 GPs from the control group were excluded because they were already trained in specialised palliative care. For those reasons, 57 GPs received the RADPAC indicators and the training and 77 GPs were considered as control group. (Figure 1)

Figure 1 - Enrolment, follow up and analyses of GPs



Of the 57 GPs that received the initial training, 28 GPs also followed the two additional peer group sessions.

The characteristics of trained GPs in the intervention and GPs in the control arm did not differ in mean age, gender, working hours, years of experience and use of a consultation service for palliative care. Also their interest in palliative care and the estimation of their own capacity to provide palliative care was the same in both groups. (Table 1) Fewer GPs in the intervention arm worked in single-handed practices. The degree of urbanisation of their practice was about the same in both groups, as well as the size of their patient list.

Table 1 - GP and practice characteristics

	Intervention (n=57)	Control (n=77)
Age mean (sd)	48.54 (7.92)	47.85 (8.16)
Male gender n (%)	36 (63.2)	45 (58.4)
Working hours n (%)		
Fulltime	29 (50.9)	41 (53.9)
Parttime	28 (49.1)	35 (46.1)
Years experience n (%)		
0 - 5	6 (10.7)	10 (13.2)
6 - 10	11 (19.6)	10 (13.2)
≥10	39 (69.6)	56 (73.7)
Interest in palliative care[1] mean (sd)	8.21 (0.92)	8.09 (1.18)
Estimation of own capacity to provide palliative care[2] mean (sd)	6.80 (0.92)	6.85 (0.93)
Practice type n (%)		
Single-handed	9 (15.8)	19 (24.7)
Dual	28 (49.1)	26 (33.8)
Group or health centre	20 (35.1)	32 (41.6)
Urbanisation degree n (%)		
High	21 (36.8)	26 (33.8)
Moderate	9 (15.8)	19 (24.7)
Low	18 (31.6)	23 (29.9)
No	9 (15.8)	9 (11.7)
Patient list mean (sd)	1710 (412)	1730 (417)
Estimated number of palliative patients / year n (%)		
≤2	4 (7.1)	7 (9.2)
3 - 5	29 (51.8)	43 (56.6)
5 - 9	20 (35.7)	23 (30.3)
≥10	3 (5.4)	3 (3.9)

[1] Interest in palliative care: numeric rating scale (NRS) from 0 (no interest at all) to 10 (extremely interested)
[2] Estimation of own capability: NRS from 0 (not capable at all) to 10 (extremely capable)

Table 2 - Patients who died of cancer, COPD or CHF during the intervention period

	Intervention (n=216)	**Control (n=271)**
Age in years (mean (sd))	73.0 (14.7)	74.0 (13.1)
Male sex n (%)	106/202 (53%)	144/258 (56%)
Primary diagnosis n (%)		
Cancer	152/216 (70%)	178/271 (66%)
CHF	32/216 (15%)	52/271 (19%)
COPD	26/216 (12%)	20/271 (7%)
Combination of cancer, COPD, CHF	6/216 (3%)	21/271 (8%)
Contact(s) with out-of-hours GP service last 3 months n (%)	114/209 (55%)	157/268 (59%)
By phone	0.79 (2.6)	0.80 (1.5)
Consultation at service	0.06 (0.3)	0.09 (0.5)
Home visits	0.85 (1.6)	1.14 (2.2)
Total	1.70 (3.3)	2.03 (2.9)
Contact(s) with own GP last month n (%)	188/212 (89%)	250/268 (93%)
By phone office hours	2.33 (2.9)	2.71 (3.0)
Home visits office hours	5.59 (5.1)	4.42 (3.6)
By phone out of office hours	0.19 (0.7)	0.10 (0.5)
Home visits out of office hours	0.46 (1.1)	0.38 (1.1)
Total	8.58 (7.5)	7.62 (6.0)
Location of death n (%)		
Home	103/210 (49%)	124/267 (46%)
Hospital	67/210 (32%)	78/267 (29%)
Nursing home	13/210 (6%)	16/267 (6%)
Care home	12/210 (6%)	21/267 (8%)
Hospice	14/210 (7%)	25/267 (9%)
Other location	1/210 (1%)	3/267 (1%)
Hospital admission(s) last 3 months n (%)	116/210 (55%)	159/255 (62%)
Hospital admissions last 3 months mean (sd)	0.82 (0.9)	0.89 (0.9)

Data are mean (sd) or n/N (%). Some percentages do not sum to 100% because of rounding.

Table 3 – Mixed effects model estimating the effect of intervention

	B[1]	95% CI	p
Number of contacts with out-of-hours GP service last 3 months			
	0.4828	-0.733 – 1.698	0.4307
Cause of death[2]			0.4599
CHF	-0.1016	-0.806 – 0.603	
COPD	-0.4729	-1.403 – 0.457	
Combination	0.6775	-0.515 – 1.870	
GP works fulltime	1.0229	-0.181 – 2.227	0.0946
Age of GP[3]	-0.0792	-0.155 – 0.003	0.0418
Interest in palliative care[3]	-0.8286	-1.461 – 0.196	0.0110
Self-efficacy regarding palliative care[3]	0.3191	-0.384 – 1.022	0.3679
Number of contacts with own GP last month			
Intervention group	0.7155	-0.935 – 2.366	0.3901
Cause of death[2]			<.0001
CHF	-3.8582	-5.434 – 2.283	
COPD	-5.0800	-7.173 – 2.987	
Combination	-4.1761	-6.883 – 1.470	
GP works fulltime	-1.1778	-2.803 – 0.447	0.1526
Age of GP[3]	-0.0035	-0.108 – 0.101	0.9474
Interest in palliative care[3]	0.3770	-0.477 – 1.231	0.3813
Self-efficacy regarding palliative care[3]	-0.6855	-1.649 – 0.278	0.1602
Intervention group			
	OR[4]	**95% CI**	**p**
Hospitalisation(s) last three months yes/no			
Intervention group	0.797	0.464 – 1.372	0.4078
Cause of death[2]			0.0132
CHF	0.729	0.423 – 1.256	
COPD	2.300	1.056 – 5.011	
Combination	3.165	1.092 – 9.172	
GP works fulltime	0.917	0.539 – 1.561	0.7467
Age of GP[3]	1.017	0.983 – 1.053	0.3207
Interest in palliative care[3]	0.802	0.606 – 1.061	0.1202
Self-efficacy regarding palliative care[3]	1.227	0.895 – 1.682	0.1993

	OR[4]	95% CI	p
Dying at home yes/no			
Intervention group	1.130	0.646 – 1.976	0.6655
Cause of death[2]			<.0001
CHF	0.393	0.227 – 0.682	
COPD	0.174	0.075 – 0.405	
Combination	0.167	0.059 – 0.472	
GP works fulltime	1.359	0.784 – 2.356	0.2697
Age of GP[3]	0.995	0.960 – 1.030	0.7644
Interest in palliative care[3]	1.109	0.833 – 1.477	0.4721
Self-efficacy regarding palliative care[3]	0.776	0.558 – 1.079	0.1295
Dying in hospital yes/no			
Intervention group	1.095	0.684 – 1.754	0.7012
Cause of death[2]			0.0009
CHF	1.501	0.862 – 2.611	
COPD	3.692	1.870 – 7.292	
Combination	2.617	1.102 – 6.217	
GP works fulltime	0.863	0.541 – 1.376	0.5303
Age of GP[3]	0.991	0.962 – 1.021	0.5468
Interest in palliative care[3]	1.021	0.800 – 1.303	0.8654
Self-efficacy regarding palliative care[3]	1.254	0.936 – 1.680	0.1271

[1] B = difference of means
[2] cause of death (cancer, CHF, COPD or combination of those; cancer is reference group), age of GP, working hours, interest in palliative care, and estimation of own capacity were included in the model as possible confounders
[3] Effects of continuous variables are assessed as one unit offsets from the mean
[4] OR = odds ratio

Table 4 - Difference between those patients that were identified as in need of palliative care and all others

	Deceased patients who were identified as in need of palliative care (n=49)	**Deceased patients without those identified (n=428)**
Age mean (sd)	64.8 (12.1)	74.6 (13.7)
Male sex n (%)	30/49 (61%)	219/409 (54%)
Primary diagnosis n (%)		
Cancer	42/49 (86%)	287/436 (66%)
CHF	2/49 (4%)	82/436 (19%)
COPD	4/49 (8%)	41/436 (9%)
Combination of cancer, COPD, CHF	1/49 (2%)	26/436 (6%)
Contact(s) with out-of-hours GP service last 3 months n (%)	24/47 (51%)	247/430 (57%)
By phone	1.26 (4.9)	0.74 (1.4)
Consultation at service	0.04 (0.2)	0.08 (0.4)
Home visits	0.64 (1.1)	1.05 (2.1)
Total	1.94 (5.2)	1.88 (2.8)
Contact(s) with own GP last month n (%)	45/49 (92%)	393/431 (91%)
By phone office hours means	3.14 (3.8)	2.47 (2.8)
Home visits office hours means	8.27 (6.7)	4.55 (3.8)
By phone out of office hours	0.46 (1.2)	0.11 (0.5)
Home visits out of office hours	1.02 (1.7)	0.35 (1.0)
Total mean	13.00 (9.8)	7.48 (6.0)
Location of death n (%)		
Home	33/49 (67%)	194/428 (45%)
Hospital	7/49 (14%)	138/428 (32%)
Nursing home	5/49 (10%)	24/428 (6%)
Care home	0/49 (0%)	33/428 (8%)
Hospice	4/49 (8%)	35/428 (8%)
Other location	0/49 (0%)	4/428 (1%)
Hospital admission(s) last 3 months n (%)	20/48 (42%)	255/417 (61%)
Hospital admissions last 3 months mean (sd)	0.60 (1.0)	0.89 (0.9)

Data are mean (sd) or n/N (%). Some percentages do not sum to 100% because of rounding.

Of the 57 trained GPs in the intervention group, 28 GPs identified 52 patients (0.91 per GP; 0-4) and in 33 cases the GP had an individual coaching session with the specialist in palliative care by phone (0.58 per GP).

Twenty-nine GPs in the intervention group did not identify any suitable patient for proactive palliative care. Reasons for not having included any patients, as mentioned by the GPs during a phone call, were having had no patients that met the RADPAC indicators, difficulty initiating an appropriate discussion on proactive palliative care, or rapid deterioration or death immediately after having communicated palliative care with the patient.

Seventy-seven of the 134 GPs (57%) returned the questionnaire with retrospective data of deceased patients: 38 of the 57 GPs (67%) in the intervention group and 39 of the 77 GPs (48%) in the control group. In total, data from 622 deceased patients was retrieved, of which 487 (78%) died of cancer, COPD or CHF or a combination of these.

In the intervention (I) and control (C) group comparable numbers of patients per GP died of cancer, CHF or COPD within the past 12 months (I:5.7; C: 6.9). Mean age of the patients (I: 73; C: 74) was the same as well as the gender distribution (male patients: I: 53%; C: 56%). The primary diagnosis of the deceased patients was cancer (I 70%; C: 66%), followed by CHF (I: 15%; C: 19%), COPD (I: 12%; C: 7%) or a combination of these diseases (I:3%; C: 8%). (Table 2)

In the mixed model analyses, we found intra cluster coefficients (ICCs) from 0.04 (dying at home) to 0.14 (out-of-hours contacts). We found no differences between the intervention and control group in the number of contacts with the GP out-of-hours cooperative in that last three months, nor in the number of contacts a patient had with their own GP in the last month, hospitalisations in the last three months, dying at home or dying in the hospital. (Table 3)
There was a relation found between the cause of death and the number of contacts that the patient had with their own GP within the last month of life ($p < 0.0001$). (Table 3) For patients with cancer, the number of contacts in the last month of life with their own GP was higher than for patients with CHF, COPD or a combination of these diseases. Cause of death was also related to having had at least one hospitalisation in the last three months of life (p 0.0132). Patients with COPD were more often hospitalised, as well as those patients with a combination of these diseases, while patients with CHF had smaller odds to be hospitalised. Finally, the cause of death was related to dying at home ($p < 0.0001$), and to dying in the hospital (p 0.0009). Patients with cancer died more often at home and less often in the hospital than patients with one of the other causes of death.

Table 5 – Mixed effects model estimating the effect of being identified as in need of palliative care

	B[1]	95% CI	p
Number of contacts with out-of-hours GP cooperative last 3 months			
Identified patients	-0.0832	-1.156 – 0.989	0.8695
Cause of death[2]			0.4831
CHF	-0.1240	-1.833 – 0.585	
COPD	-0.470	-1.404 – 0.464	
Combination	0.6421	-0.553 – 1.837	
GP works fulltime	1.0132	-0.164 – 2.190	0.0904
Age of GP[3]	-0.0776	-0.152 - -0.003	0.0410
Interest in palliative care[3]	-0.8049	-1.422 - -0.188	0.0113
Self-efficacy regarding palliative care[3]	0.3545	-0.328 – 1.037	0.3033
Number of contacts with own GP last month			
Identified patients	4.5218	2.336 – 6.707	0.0006
Cause of death[2]			<0.0001
CHF	-3.5003	-5.054 - -1.947	
COPD	-4.8675	-6.920 - -2.815	
Combination	-3.9826	-6.633 - -1.332	
GP works fulltime	-1.3109	-2.865 – 0.243	0.0970
Age of GP[3]	-0.0008	-1.101 – 0.099	0.9876
Interest in palliative care[3]	0.4259	-0.387 – 1.238	0.2993
Self-efficacy regarding palliative care[3]	-0.8122	-1.730 – 0.105	0.0817
Intervention group			
	OR[4]	**95% CI**	**p**
Hospitalisation(s) last three months yes/no			
Identified patients	0.485	0.215 – 0.975	0.0437
Cause of death[2]			0.0117
CHF	0.682	0.395 – 1.179	
COPD	2.227	1.017 – 4.879	
Combination	3.105	1.074 – 8.973	
GP works fulltime	0.939	0.557 – 1.583	0.8094
Age of GP[3]	1.018	0.984 – 1.054	0.2937
Interest in palliative care[3]	0.792	0.603 – 1.041	0.0935
Self-efficacy regarding palliative care[3]	1.241	0.912 – 1.688	0.1663

	OR[4]	95% CI	p
Dying at home yes/no			
Intervention group	2.126	0.974 – 4.643	0.0572
Cause of death[2]			<0.0001
CHF	0.418	0.240 – 0.726	
COPD	0.177	0.076 – 0.414	
Combination	0.172	0.061 – 0.485	
GP works fulltime	1.321	0.762 – 2.291	0.3166
Age of GP[3]	0.995	0.960 – 1.030	0.7629
Interest in palliative care[3]	1.116	0.839 – 1.483	0.4465
Self-efficacy regarding palliative care[3]	0.761	0.549 – 1.055	0.1000
Dying in hospital yes/no			
Identified patients	0.380	0.148 – 0.975	0.0449
Cause of death[2]			0.0011
CHF	1.361	0.781 – 2.371	
COPD	3.867	1.928 – 7.757	
Combination	2.423	1.025 – 5.726	
GP works fulltime	0.884	0.554 – 1.409	0.5991
Age of GP[3]	0.989	0.960 – 1.019	0.4619
Interest in palliative care[3]	1.031	0.809 – 1.313	0.8025
Self-efficacy regarding palliative care[3]	1.309	0.980 – 1.748	0.0678

[1] B = difference of means
[2] cause of death (cancer, CHF, COPD or combination of those; cancer is reference group), age of GP, working hours, interest in palliative care , and estimation of own capacity were included in the model as possible confounders
[3] Effects of continuous variables are assessed as one unit offsets from the mean
[4] OR = odds ratio

Post-hoc analysis: identified patients versus all other patients

Of the 52 patients that had been identified as in need of palliative care, there were 50 with available data; two patients had moved and it was not possible to follow up on their status. One patient (with COPD) was still alive at the moment that the retrospective data was collected. Data of the remaining 49 deceased patients was compared to data of all other patients from GPs in the intervention as well as the control group (n=437) that died of cancer, COPD or CHF or a combination of these.

Table 4 shows that the identified patients were younger than the other patients (64.8 versus 74.6 years). Also their primary diagnosis differed; the identified patients were more likely to have cancer (86 versus 66%), and less often CHF (4% versus 19%).

The number of contacts in the last three months of life with the out-of-hours GP service was the same in both groups. Yet, the identified patients had more contacts with their own GP in the last month of life (13.00 versus 7.48). Also the location of death differed: the identified patients died at home more often (67 versus 45%) and less often in the hospital (14 versus 32%).

Finally, a smaller percentage of the identified patients had had at least one hospitalisation in the last three months of their life as compared to the other patients (42 versus 61). The mean number of hospital admissions of identified patients was also lower (0.60 versus 0.89).

We found no differences in number of contacts with the out-of-hours GP cooperative in the clustered model, controlled for GP clusters, cause of death (cancer, CHF, COPD or a combination of these), the GP working part-time or fulltime, age of the GP, interest in palliative care and self-efficacy regarding providing palliative care. However, there was a difference in the number of contacts that identified patients had with their own GP in the last month before death (p 0.0006). They were less often hospitalised in the last three months of life (p 0.0437), and died less often in the hospital (p 0.0449). Although they also died more often at home, this difference was not statistically significant (p 0.0572).

DISCUSSION

This study reports the results of an RCT on the effects of training GPs in early identification of patients that could profit from palliative care and in structured anticipatory palliative care planning. There was no difference found in the primary outcome: the number of consultations with the out-of-hours cooperative was the same for the intervention and control group. Also no effects were found in the secondary outcome parameters: other types of

contact with their own GP, hospital admissions and place of death. Yet, in the intervention group only 24% of the patients that died of cancer, CHF or COPD, had been identified as in need of palliative care. In addition, only half of the trained GPs actually identified patients, and coaching sessions were requested for only a part of patients. For those reasons, we performed a post-hoc analysis in which we studied the outcomes regarding those patients which had actually been identified by the trained GPs as in need of palliative care in comparison to all the other patients from the intervention and control group. The identified patients had had more contact with their own GP in the last month of life, had half the chance to have a hospitalisation in the last three months of life, had less than half the chance to die in hospital, and twice the chance of dying at home, although the latter was not statistically significant. Of the identified patients 67% died at home. In a recent study concerning place of death of home-dwelling patients that died after a protracted terminal illness, 52.5% of the Dutch patients died at home, which is a much lower occurrence than of our identified patients.[31]

The mean age of the identified patients was ten years younger than that of the other patients. This may have influenced the place of death, as younger patients are more likely to have a partner who can take care of them which may have increased their chance of dying at home. Also in an English study, the chance of dying at home or in a hospice was higher for younger patients.[32] Yet, in a German study, younger patients had a higher chance to die in hospital.[33] The influence of age on the outcome is therefore unclear.

The positive effects of the intervention regarding those patients that had had anticipatory palliative care is in accordance with several other RCTs. In a Canadian nurse-led study, early palliative care for patients with advanced cancer had a significant effect on parameters such as quality of life and depressed mood.[16] However, they did not find an effect on the number of hospitalisations. In an American study, Temel *et al*. found that early palliative care resulted in an improved quality of life and mood, less aggressive interventions and prolonged survival in patients with advanced lung cancer.[15] In a cluster-RCT in Canada, Zimmermann *et al*. found a significant improvement in quality of life at the end of life and satisfaction with care, but no significant effect on the quality of life as measured with the Facit-spiritual well being of advanced cancer patients 3 months after inclusion.[17] All three studies were restricted to patients with cancer, and in all three studies patients were included via hospitals, in contrast to our study. In these studies, the intervention was hospital-based and delivered directly to the patients. In our study GPs were included as participants, not patients. We provided them with training and tools to identify and proactively plan the care for palliative patients.

Yet, only half of the trained GPs in the intervention group identified patients in need of palliative care, and the identified number per GP was only a fraction of the number of patients that died per GP during this period. These aspects indicate an identification problem with regard to the RADPAC tool and/or an inclusion threshold. Secondly, and probably related to the limited number of identified patients: our intervention addressed GPs, while it is often a medical specialist who remains the primary caregiver for patients in their final stage of life. This is related to the fact that patients still receive disease-oriented interventions. In such cases, training GPs without actively involving the medical specialists will hardly influence the identification of palliative patients or palliative care planning. Finally, although GPs are the experts in discussing end-of-life aspects with their patients, and our intervention further strengthened this expertise, the reality of daily life still is, that timely palliative care and involving the patient in anticipating a care trajectory remains difficult, particularly in non-cancer patients. Seeing as the entire disease trajectory of patients with COPD can span 15-20 years, and of patients with CHF spans 5-10 years, which is much longer than the trajectory of most patients with cancer, changing such a long-term relation will require more efforts than just a training on anticipatory palliative care. Janssen *et al*. described in 2011 that for several reasons, the quality of communication about end-of-life issues with patients with COPD needs to be improved.[23] Also in our study, more patients with cancer had been included than patients with COPD or CHF. This was also one of the conclusions of a review on palliative patient-GP communication.[34]

Strengths and weaknesses

This is the first RCT to study the effect of training GPs in identifying patients in need of palliative care and in providing structured palliative care planning. We were able to include many GPs in a very short period of time, which confirms their interest in palliative care.[25,26] Although we planned to perform an intention-to-treat analysis, the GPs which were allocated to the intervention group but did not follow the training, were lost to follow up. The characteristics of these GPs differed slightly; they were more likely to work fulltime and they had a larger patient list. Yet, we do not think that this loss to follow up influenced our main findings, as we only found differences in the post-hoc analyses in which the identified patients were compared to all other deceased patients. Next, only 57% of the GPs returned the questionnaire with patient data, and therefore we could not include their deceased patients in the analyses. Thirdly, the positive effects we found regarding those patients that had been identified as in need of palliative care, were found in a post-hoc analysis, which has not been described in the study protocol. These results need to be explored further in future studies, as we don't know whether these differences are caused by the intervention or because the identified patients are a selected group. Lastly, it was not possible to prospectively register and monitor patient data in the control group, and thus of having quality of life as outcome measure.

CONCLUSIONS

This study shows that the design we chose was not completely compatible with an intervention that combined identification of patients in need of palliative care and anticipatory care planning. Only a portion of the eligible patients had been identified, and in this subgroup a post-hoc analysis showed positive effects of having identified patients as in need of palliative care and providing anticipatory palliative care. For that reason, the absence of differences between the entire intervention and control group does not show a failure of anticipatory palliative care; it reflects a low number of identified patients.

We have used the insights from this study to adapt our methodology and to ensure that patients are timely identified as in need of palliative care. These adaptations are currently being applied in a prospective study on proactive supportive care in patients with COPD. Patients are recruited by the attending specialist at the moment of hospitalisation for an acute exacerbation COPD, palliative care is provided by a dedicated hospital palliative care team, and the primary outcome is quality of life.[35]

We thank all GPs and practice assistants who participated in the study and data collection.

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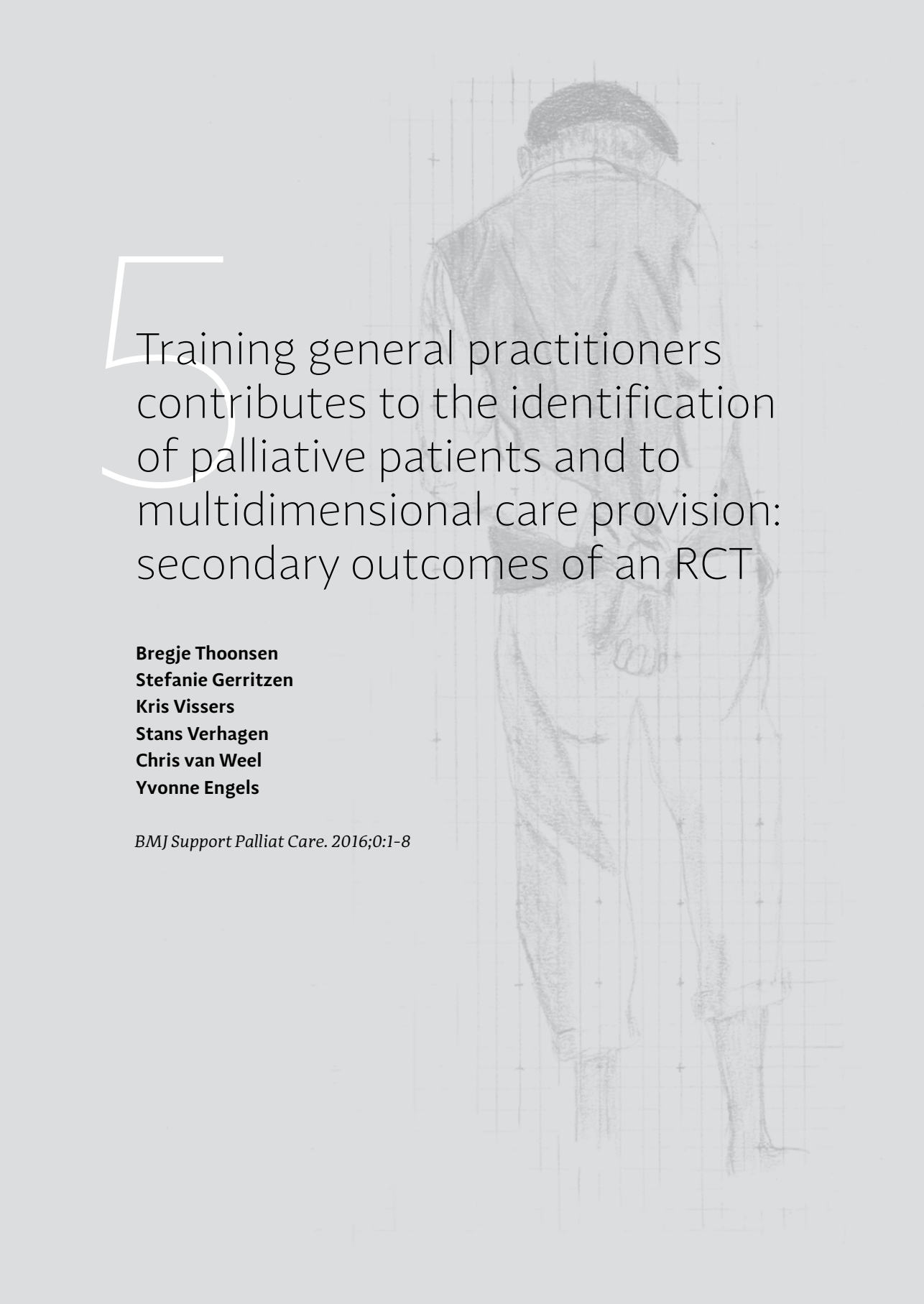

5 Training general practitioners contributes to the identification of palliative patients and to multidimensional care provision: secondary outcomes of an RCT

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BMJ Support Palliat Care. 2016;0:1-8

Abstract

Introduction

To support general practitioners (GPs) in providing early palliative care to patients with cancer, COPD or heart failure, the RADboud indicators for PAlliative Care needs (RADPAC) and a training were developed to identify such patients and to facilitate anticipatory palliative care planning. We studied whether GPs, after 1 year of training, identified more palliative patients and provided multidimensional and multidisciplinary care more often than untrained GPs.

Methods

We performed a survey 1 year after GPs in the intervention group of an RCT were trained. With the help of a questionnaire, all 134 GPs were asked how many palliative patients they had identified, and whether anticipatory care was provided. We studied number of identified palliative patients, expected lifetime, contact frequency, whether multidimensional care was provided and which other disciplines were involved.

Results

Trained GPs identified more palliative patients than untrained GPs (median 3 versus 2; p 0.046) and more often provided multidimensional palliative care (p 0.024). In both conditions, most identified patients had cancer.

Conclusions

RADPAC sensitises GPs in the identification of palliative patients. Trained GPs more often provided multidimensional palliative care. Further adaptation and evaluation of the tools and training are necessary to improve early palliative care for patients with organ failure.

INTRODUCTION

Many patients with an advanced stage of cancer or another life limiting disease suffer from problems like pain, nausea or a depressed mood.[1-3] In several studies from the USA and Canada, mainly regarding patients with cancer, early palliative care increased quality of life and decreased emotional distress and useless aggressive interventions.[4-6] Despite these positive findings, palliative care is still often restricted to reactive terminal care and to patients with cancer.[7] However, not only do existing problems and requirements need to be addressed, future scenarios should be considered. Early initiation of palliative care enables anticipation of future problems, needs and wishes of patients.

Also, in the Netherlands, early palliative care is not a part of daily practice. The GP is the preferred professional to coordinate palliative care[8] as most patients live at home in the final phase of their lives. Every person has his or her own gate keeping GP; also, out of hours care is arranged via the GP out-of-hours cooperatives, which, in addition, have a gate keeping function. GPs consider palliative care as an attractive and important aspect of their profession, even though it is demanding and challenging.[9,10] However, they consider timely identification of patients who can benefit from anticipatory palliative care challenging, particularly in patients chronic obstructive pulmonary disease (COPD) or congestive heart failure (CHF), as the course of these disease trajectories is difficult to predict.[2,11-14]

For those reasons we developed the RADboud indicators for PAlliative Care needs (RADPAC), to support GPs in the early identification of those patients with cancer, COPD or CHF that might profit from palliative care.[15,16] RADPAC contains indicators for GPs, used as triggers to identify a need for palliative care in these patient groups. Besides, we developed a specific training for GPs on using RADPAC and in how to provide structured anticipatory palliative care. The effect of this training was subsequently evaluated in a randomised controlled trial (RCT) in which over 130 GPs participated.[17] We did not find a difference between the patients with cancer, COPD or CHF who died in the year after start of the RCT in any of the groups of trained and untrained GPs in contact with the out-of-hours GP cooperative in the patients' final months of life, contacts with their own GP, hospitalisations or place of death. However, of those patients of trained GPs that died in the year after the training, only one-third had been identified by their GPs as being palliative patients. Those patients actually identified had had significantly more contacts with their GP (13 versus 7.48/month), had undergone less hospitalisations (14 versus 32%), and more often died at home (67 versus 45%) and less often in hospital (14 versus 32%) than all other deceased patients.[17] These retrospectively collected outcome measures of deceased patients were limited to short-term effects , did not provide insights into the palliative care provided, and did not provide insights in the effects of the several components of the training.

For those reasons, 1 year after start of the RCT, we studied whether trained GPs at that time cared for a larger number of palliative patients than the untrained GPs, and whether the care provided more often was multidimensional (exploration of somatic, social and financial, care giving and activities of daily living, and existential and psychological problems and needs) and multiprofessional (different types of health care professionals involved). Finally, in the untrained GP group, we studied the short-term effect of providing the RADPAC.

METHODS

Design

We performed a survey 1 year after start of an RCT, begun 2010, to compare trained (intervention) and untrained (control) GPs as additional, secondary outcomes.

Ethical procedures

The study was conducted after approval of the research ethics committee of the Radboud University Nijmegen Medical Center in accordance with the Medical Research Involving Human Subjects Acts (WMO) (registration number 2007/205), and registered in the Netherlands Trial Register. (NTR2815)

Participants

In total, 134 GPs who had participated in the RCT 1 year prior received a questionnaire by mail in Spring 2011. Of them, 57 GPs (intervention group) had been trained 1 year prior in the early identification of their palliative patients using the RADPAC, and in providing structured proactive palliative care in their daily practice, while the 77 untrained GPs had provided care as usual (control group).

Intervention the trained GPs had received 1 year prior

One year before this survey, the GPs allocated to the intervention group had undergone a 5h group training session in early identification and proactive palliative care planning. During this training, they received and practiced with the following tools, developed within our research group: (1) the RADPAC, a tool with specific indicators to identify patients with, respectively, COPD, CHF and cancer, who might profit of palliative care,[16] and (2) a proactive palliative care planning card, the 'problems and needs square': a tool to make a structured proactive care plan in which actual as well as possible future problems (somatic, social and financial, care giving and activities of daily living, and existential and psychological), dying scenarios and patient's wishes and needs are considered. The GPs of the trained group were invited to apply this knowledge and these tools in their daily practice, and thus to identify palliative patients and to make a proactive palliative care plan for each of them. (Appendices 1 and 2)

Regarding each identified palliative patient, the trained GPs were offered an individual coaching session by phone with a consultant specialised in palliative care. During this session, they discussed the anticipatory care plan the GP had prepared, and adapted it if needed. Finally, all trained GPs were offered two additional face-to-face peer group sessions in which experiences could be exchanged and could practice communicating end-of-life aspects on simulated patients.[16] The GPs in the control condition had not received any training or intervention.

Data collection

Baseline characteristics, demographics and practice characteristics of the GPs had been collected 1 year prior, at the start of the RCT. These were age, gender, fulltime equivalent work experience, years of experience as a GP (≤ 1 year, 1-5 years, 5-9 years, ≥ 10 years), their interest in palliative care (numeric rating scale (NRS) from 0, no interest at all, to 10, very interested) and their self-efficacy in providing palliative care (NRS from 0, no confidence at all, to 10, very confident). Also collected was information on the kind of practice (solo, duo or group) and the degree of urbanisation of their general practice as well as their mean patient list and the estimated number of palliative patients per year.

Effects on the provision of palliative care, 1 year after the training took place

With the help of a questionnaire, all GPs (trained or untrained) were asked how many palliative patients they currently cared for. They did not receive a definition of palliative care, but they did know that the research project concerned identification of and proactive care planning for palliative patients with the GP as coordinator. Of each of these patients, they were asked to provide gender, age, disease (cancer, COPD, CHF, other), expected remaining lifetime (in weeks), their current type and number of contacts with the patient (per month; respectively by phone, consultation or home visits); whether a key information summary had been handed over to the GP out-of-hours cooperative; which type of problems they had explored (somatic, social and financial, care giving and activities of daily living, spiritual and psychological aspects; yes/no questions) and the type of other involved disciplines in the care for the patient (physiotherapist, spiritual caregiver, social work, medical specialist, palliative care consultant, psychologist, nursing aid at home, volunteers; yes/no questions).

Short-term effects of applying RADPAC

Three weeks after having received the questionnaire, GPs in the control condition who had responded to the first questionnaire were sent the RADPAC, which they had never seen before.[16] They were asked to complete another, similar questionnaire again, in which they could add those palliative patients they recognised as being palliative, after being triggered by the RADPAC indicators.

Table 1 - General practitioners and practice characteristics responders and non responders

GPs that participated in the RCT 1 year prior	**Intervention (n=12)**	**Control (n=28)**	**Intervention (n=45)**	**Control (n=49)**
	RESPONDERS		NONRESPONDERS	
Age in years mean (sd)	45 (8)	48 (8)	49 (8)	48 (8)
Male gender n (%)	9 (75.0)	19 (67.9)	27 (60.0)	26 (53.1)
Working hours n (%)				
Fulltime	5 (41.7)	17 (63.0)	21 (46.7)	25 (51.0)
Part-time	7 (58.3)	10 (37.0)	24 (53.3)	24 (49.0)
Years of experience n (%)				
≤1	0 (0)	0 (0)	1 (2.3)	1 (2.0)
1-5	2 (16.7)	2 (7.4)	3 (6.8)	7 (14.3)
6-10	2 (17.7)	4 (14.8)	9 (20.5)	6 (12.2)
≥10	8 (66.7)	21 (77.8)	31 (70.5)	35 (71.4)
Interest in palliative care[1] NRS 0-10 (IQR)	8.0 (0.0)	8.0 (1.0)	8.0 (1.0)	8.0 (2.0)
Estimation of self-efficacy in palliative care provision[2] NRS 0-10 (IQR)	7.0 (2.0)	7.0 (0.5)	7.0 (0.8)	7.0 (1.0)
Practice type n (%)				
Single-handed	2 (16.7)	9 (32.1)	7 (15.6)	10 (20.4)
Dual	7 (58.3)	8 (28.6)	21 (46.7)	18 (36.7)
Group or health centre	3 (25.0)	11 (39.3)	17 (37.8)	21 (42.9)
Urbanisation degree n (%)				
Urban	8 (66.7)	14 (50)	22 (48.9)	32 (65.3)
Rural	4 (33.3)	14 (50)	23 (51.1)	17 (34.7)
Patient list mean (sd)	3491 (1579)	2787 (1389)	3602 (2101)	3024 (1535)
Estimated number of palliative patients / year n (%)				
≤2	4 (33.3)	13 (46.4)	3 (3.8)	6 (12.2)
3-5	5 (41.7)	11 (39.3)	22 (50.0)	24 (49.0)
6-9	3 (25)	3 (10.7)	16 (36.4)	16 (32.7)
≥10	0 (0)	1 (3.6)	3 (6.8)	3 (6.1)

[1] Interest in palliative care: numeric rating scale (NRS) from 0 (no interest at all) to 10 (extremely interested).
[2] Estimation of self-efficacy: NRS from 0 (not capable at all) to 10 (extremely capable).

GPs, general practitioners; RCT, randomised controlled trial.

Statistical analysis

To study differences between trained and untrained GPs, we analysed, using the data of the first questionnaire, the number of palliative patients the GPs were currently aware of and their characteristics, as well as the estimated remaining lifetime (mean and % > 4 weeks) – whether or not the GP out-of-hours cooperative was informed – the number and type of palliative care domains that were considered per patient as well as the percentage of patients who had had a multidimensional problem and needs exploration (operationalised as three or more domains being explored) and number and type of involved disciplines. Additional palliative patient data collected from the untrained GPs after having received the RADPAC were not included in these analyses but described separately.

Statistical analyses were performed with the use of SPSS software, V20.0. Descriptive statistics were used to calculate frequencies, means, and SDs of the study variables. Differences between trained and untrained GPs, and between patients of trained and of untrained GPs, were assessed with the use of Fisher Exact tests for categorical variables, as some cells counted less than 5 and, because of the relatively small number of patients, with the non-parametric Mann Whitney tests for continuous variables. As these data concerned secondary outcomes of an RCT, no power calculation was made.

RESULTS

In total, 12/57 trained GPs (21%) from the intervention group and 28/77 (36%) of the control group filled in the questionnaire. Responding trained and untrained GPs had about the same mean age (45 and 48 years, respectively; Table 1). Of the trained GPs, 75% were males, and of the untrained GPs, 68% were males. Besides, 42% of the trained GPs and 63% of the untrained GPs worked fulltime. A lower percentage of the trained GPs had 10 or more years' experience (67 versus 78%). Their interest in palliative care was the same (both NRS 8) as well as their self-efficacy in providing it (both NRS 7). Most trained GPs worked in a dual practice (58%), and the untrained GPs more often in a solo (32%) or group practice or health care centre (39%). Of the trained GPs, 67% worked in an urban region, while this figure was 50% for the untrained GPs. The patient list of the practice where the trained GPs worked was higher than the list of the practices of the untrained GPs (respectively 3491 and 2787 patients). Almost all GPs in both groups were estimated to have between 0 and 5 palliative patients per year (75 and 86%, respectively).

Of the non-responders, the percentage women was higher, they worked in larger practices with a longer patient list and more palliative patients. (Table 1)

In total, all GPs together had identified 119 (46 plus 73) palliative patients (Figure 1). The trained GPs had identified a median of 3 palliative patients, which was significantly higher than the median of 2 patients in the untrained group (p 0.046; Table 2).

Table 2 - Characteristics of identified palliative patients and palliative care they received

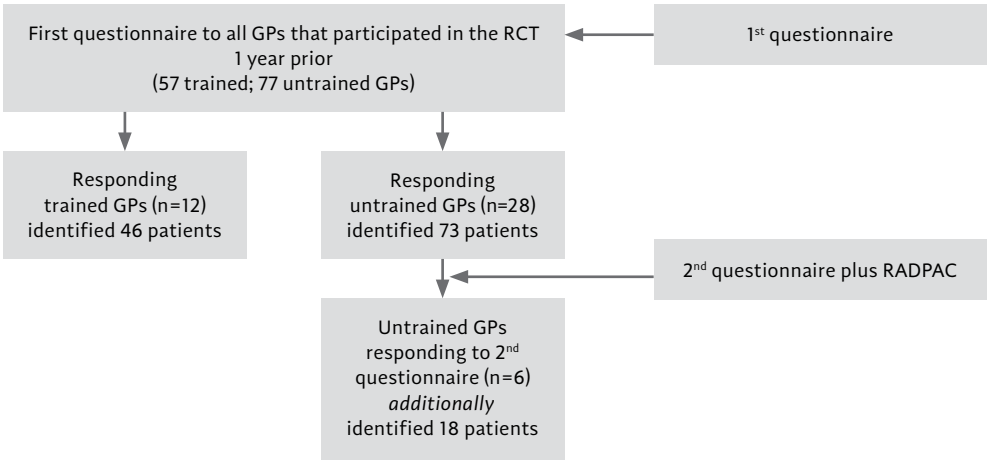
	Patients of trained GPs (n=46)	**Patients of untrained GPs (n=73)**	***p***
Number of identified patients median (min-max)	3 (2-8)	2 (1-7)	***0.046***
Age in years median (min-max)	74.5 (39-96)	70 (10-98)	*0.064*
Male gender[1] n (%) Missing	20 (43.5) 5	35 (54.7) 9	*0.544*
Primary diagnosis[1] n (%)			*0.630*
Cancer	34 (75.6)	58 (79.5)	
COPD	2 (4.4)	1 (1.4)	
CHF	0 (0)	0 (0)	
Other*	9 (20)	14 (19.2)	
Expected lifetime weeks median (min-max)	16 (2-100)	20 (1-82)	*0.728*
Expected remaining lifetime ≥ 4 weeks[1] n (%) Missings expected lifetime n (%)	43 (93.5) 3 (7)	47 (64.4) 14 (19)	*0.062*
Current monthly contact frequency median (min-max)	4 (0-24)	2 (1-36)	*0.690*
Contact(s) per patient with own GP last month ≥ 1 monthly n (%)			
By phone office hours	25 (52.1)	19 (27.5)	***0.025***
By consultation office hours	14 (27.5)	12 (17.6)	*0.243*
Home visits office hours	41 (80.4)	60 (85.7)	*0.739*
GP informed out-of-hour service about patient[1] n (%)	26 (56.5)	45 (61.6)	*0.324*
Type of dimensions[1] n (%) Somatic Social and financial Activities of daily living (ADL) Spiritual and psychological	 25 (54.3) 7 (15.2) 24 (52.2) 19 (41.3)	 39 (53.4) 7 (9.6) 30 (41.1) 17 (23.3)	 *0.852* *0.564* *0.455* *0.103*
Number of dimensions median (min-max)	2 (0-4)	1 (0-4)	*0.266*
Number of dimensions[1] n (%) 0 dimensions 1 dimension 2 dimensions ≥ 3 dimensions	 20 (43.5) 1 (0.02) 5 (0.3) 20 (43.5)	 31 (42.5) 7 (0.1) 20 (43.5) 15 (20.5)	 ***0.024***
Type of disciplines[1] yes (%) Physiotherapist Spiritual caregiver Social work Medical specialist Palliative care consultant Psychologist Home care (nurse) Volunteers	 1 (2) 2 (4) 0 (0) 34 (74) 3 (7) 0 (0) 19 (41) 2 (4)	 7 (10) 5 (7) 2 (3) 49 (67) 7 (10) 2 (3) 21 (29) 12 (16)	 *0.141* *0.700* *0.515* *0.416* *0.738* *0.515* *0.323* ***0.043***
Number of disciplines median (min-max)	2 (0-4)	2 (0-5)	*0.849*

*Combination of CHF, COPD and cancer or another disease like dementia, neurological causes or kidney failure. Data are mean (sd) or n (%). Some percentages do not sum to 100% because of rounding.

[1] Fisher exact for categorical variables. Other p values are Mann Whitney tests.

CHF, congestive heart failure; COPD, chronic obstructive pulmonary disease; GP, general practitioner. Bold indicates statistically significant p-values.

Figure 1 – Prisma flow chart of involved GPs and identified palliative patients.



GP, general practitioner; RCT, randomised controlled trial; RADPAC, RADboud indicators of Palliative Care needs.

Of the palliative patients, the median age was about the same in both groups (74.5 versus 70 years; p 0.064) as well as their gender (44 versus 55% males; p 0.544). In both groups, the primary diagnosis was most often cancer (76 and 80%; p 0.630). The category 'other' diseases (respectively, 20% and 19%) mostly concerned a combination of cancer and CHF, CHF and COPD or COPD and cancer. A few times other diagnoses like dementia, amyotrophic lateral sclerosis, a cerebrovascular accident, or chronic kidney failure were mentioned.

The median estimated remaining lifetime of the palliative patients was about the same in trained and untrained GPs (16 versus 20 weeks; p 0.728). The percentage of expected remaining lifetime being ≥4 weeks was non-significantly higher in patients of the trained GPs (94% versus 64% of the patients; p 0.062).

We found no significant difference between trained and untrained GPs in the percentage of patients of whom the GP out-of-hours cooperative was informed (57 versus 62%; p 0.324). The median number of total contacts with their own GP was about the same in both groups (4 versus 2; p 0.690). Almost all patients had had at least one monthly contact with their GP. The percentage of patients who had had at least one contact by phone was higher in the trained GP group (52 versus 28%; p 0.025). The percentage of patients who had had at least one monthly consultations did not differ significantly between both groups (28 versus 18%; p 0.243), nor did the percentage of patients with at least one home visit per month (80 and 86%; p 0.739).

Table 3 – Untrained GPs who completed in 1st and 2nd* questionnaire

Untrained GP (n=6)	Identified** palliative patients 1st questionnaire (n)	Cancer	Identified*** palliative patients 2nd questionnaire (n)	Cancer	COPD	CHF	Total of identified patients (n)
A	1	1	1	1			2
B	1	1	2	1		1	3
C	1	1	2	1		1	3
D	4	4	6	5		1	10
E	3	3	3	3			6
F	1	1	4	2	1	1	5

* In this equal questionnaire, they were asked to mention additionally identified patients, triggered by the RADPAC that they received alongside.
** These GPs only identified those patients with cancer who were mentioned in the first questionnaire.
*** No patients with other diseases than cancer, COPD or CHF were identified by these GPs.
CHF, congestive heart failure; COPD, chronic obstructive pulmonary disease; GP, general practitioner.

The median number of explored dimensions (somatic, social and financial, activities of daily living (ADL), and spiritual and psychological) did not differ significantly (2 and 1 respectively; p 0.266), but trained GPs more often explored ≥ 3 dimensions (44 versus 21%; p 0.024). In the patients of the trained GPs, the spiritual and psychological dimension was twice as often explored, but this difference was not significant (41% versus 23%; p 0.103).

The median number of other involved disciplines was the same in both groups (2; p 0.849). In the care of patients of the untrained GPs, volunteers were significantly more often involved (4 and 16%; p 0.043).

Three weeks after the first questionnaire, the untrained GPs who had responded to the first questionnaire received the RADPAC, and were asked to use it to complete a similar questionnaire again, adding patients additionally identified as being palliative. Six untrained GPs (6/28 = 21% of the GPs that responded to the first questionnaire)also completed this questionnaire and became aware of a mean of 3 additional palliative patients (Table 3) . These six GPs had already identified a mean of 1.8 patients after the first questionnaire. Of these 18 patients, 5 patients (28%) had chronic organ failure.

DISCUSSION

One year after start of an RCT in which GPs in the intervention condition were trained in identifying their palliative patients and in structured, proactive palliative care, trained GPs were aware of significantly more palliative patients in their practice and more often provided multidimensional care. With the help of an additional questionnaire a few weeks later, we also found that untrained GPs who received the RADPAC identified additional palliative patients.[16]

The percentage of patients with an expected remaining lifetime of ≥ 4 weeks was non-significantly higher in the trained GP group. However, as we performed a cross-sectional study and did not follow-up when these patients actually died, we do not know how long the actual survival was and whether the correctness of the estimation differed between trained and untrained GPs. Twenty per cent of the untrained GPs did not complete the question about the remaining lifetime expectancy, while this figure was only 7% in the trained GPs. In the untrained GPs, a prognostic paralysis might have contributed to this large number of missings.[18] Two other studies also showed that it is hard for GPs to provide such figures. [9,19-23]

Of the trained GPs, twice as many palliative patients had had a multidimensional problems and needs assessment, meaning that at least three dimensions (somatic, social and financial, ADL, and spiritual and psychological) were explored. Particularly, exploration of the spiritual and psychological dimension contributed to this difference. A Dutch study of Van der Brandt showed that psychological and spiritual aspects of care need more attention in the last days of the dying patients.[24-26] Although person-centred, integrated care belongs to the core values of GPs and the importance of the bio psychosocial model in the chronic care context has been recognised by all relevant Dutch stakeholders, this ideal appeared to be poorly embedded[8]; our results suggest that this is also true for palliative care. This is not a surprise, since guidelines and standards as well as reimbursement of care expenditures are mainly based on biomedical outcome indicators, ignoring the psychological or spiritual aspects.

Most often, the somatic domain was explored by both the trained and untrained GPs. This finding is in line with their medical background. However, in contrast to a study by Meijler *et al.*, [10] which showed that a workshop in palliative care mainly improved attention and knowledge of the somatic dimension, the trained GPs in our study did not differ from the untrained GPs in this aspect.[27] As the somatic domain was only explored in half of the identified patients, this also implies that for half of the patients this was not carried out, although it is known that many patients with an advanced stage of cancer,[1] COPD[2] and CHF, suffer multiple problems and many patients do not report these problems spontaneously.[28,29]

No significant difference between trained and untrained GPs was found in the number of disciplines involved in the palliative care of their patients. In about two-third of the patients of as well the trained as the untrained GPs, a medical specialist was involved. In many cases, palliative patients continue to visit the medical specialist, even when no life prolonging treatment options are available anymore. Weeks *et al*.[30] found that many patients with incurable cancer receiving chemotherapy did not understand that chemotherapy is unlikely to be curative. This wrong perception compromises their ability to make informed treatment decisions. It implies that patients often receive treatments too long. Improving interdisciplinary collaboration between medical specialist and GP might contribute to shared decision-making regarding advantages and disadvantages of treatment options.

The six untrained GPs who responded to the second questionnaire, after having received the RADPAC, became aware of a mean of 3 additional palliative patients, which was even more than the 1.8 patients they mentioned in the first questionnaire, suggesting that RADPAC contributes to the identification of palliative patients. A quarter of these additional palliative patients had COPD or CHF, which is a higher percentage than in the first questionnaire of as well the trained as the untrained GPs, and more in line with Dutch mortality data of these diseases.[31]

These positive effects indicate that RADPAC might be an answer to the need for tools to identify palliative patients in an earlier stage.[16,32-34]

Strengths and weaknesses

This is one of the first studies that, using an additional question within an RCT, evaluated long-term effects of training in which GPs in the intervention group had been trained in identifying patients in need of palliative care and in providing structured, proactive palliative care.[15,16] In this study, we also tried to make a distinction between the effects of the RADPAC and those of training in providing multidimensional palliative care.

Unfortunately, the response rate was extremely low. Regarding the trained GPs, the response rate was only 21%. Of the untrained GPs, the response rate was 36%, but regarding the second questionnaire in this group this figure was also low (21%). Probably mainly the most motivated GPs will have responded, which might have influenced the results. Another questionnaire regarding the primary and secondary outcomes of the RCT, send to the same GPs at the same time and described elsewhere[17] resulted in a response rate of 57%, which is much higher. An explanation might be that the practice assistant could complete that questionnaire, which concerned deceased patients, while the questionnaire about current palliative patients had to be completed by the GP. The trained GPs had completed a considerable number of forms during the intervention period, the year before. Voting with their feet as

a result of fatigue regarding being asked again to complete a questionnaire, and time investment of all GPs might have been barriers to completing it.[35] The GPs received this questionnaire in the run-up to a national protest action, in which most Dutch GPs signed a manifest 'Het roer moet om' (*A change of direction*) against the growing workload of administration, forms, and obligations.[36] This probably will have contributed to the low response rate. Another limitation is that we had not asked how many palliative patients the GPs cared for at baseline. Owing to this, the low response rate and the fact that these data were secondary outcomes that were not used in a power calculation, all findings should be interpreted with caution.

CONCLUSIONS

This study shows that a training programme in proactive palliative care provision and in using RADPAC to identify palliative patients even 1 year later improves the number of identified palliative patients. Additionally, multidimensional care, which could, particularly, be contributed to more attention given to the spiritual and psychological dimension, was more often offered by trained GPs.

Untrained GPs who 3 weeks after the first questionnaire received the RADPAC and were asked to consider their patient list again to identify additional palliative patients, in total identified more patients than the trained GPs; and identified a larger percentage of patients with COPD or CHF. This indicates that, although a training programme in using the RADPAC still positively influences awareness of palliative patients 1 year later, RADPAC seems to have the largest effect immediately after applying it, and particularly in detecting patients with COPD or CHF in need of palliative care. As RADPAC is restricted to cancer, COPD and CHF, we recommend extension with indicators for other life-limiting diseases, like has been done in other tools.[20]

Finally, we recommend an implementation trajectory in which GPs as well as medical specialists are involved, in which timely identification of palliative patients is an ongoing process.

ACKNOWLEDGEMENTS

We thank all the participating GPs.

Appendix 1 – The RADboud indicators of PAlliative Care needs (RADPAC)

Congestive Heart Failure	1. The patient has severe limitations, experiences symptoms even while at rest. Mostly bedbound patients. (NYHA IV) 2. There were frequent hospital admissions (>3 per year) 3. The patient has frequent exacerbations of severe heart failure (>3 per year) 4. The patient is moderately disabled; dependent. Requires considerable assistance and frequent care (Karnofsky score ≤50%) 5. The patient's weight increases and fails to respond to increased dose of diuretics 6. General deterioration of the clinical situation (oedema, orthopnoea, nycturia, dyspnoea) 7. The patient mentions 'end of life approaching'
Chronic Obstructive Pulmonary Disease	1. The patient is moderately disabled; dependent. Requires considerable assistance and frequent care (Karnofsky score ≤50%) 2. The patient has substantial weight loss (±10% loss of bodyweight in six months) 3. The presence of congestive heart failure 4. The patient has orthopnoea 5. The patient mentions 'end of life approaching' 6. There are objective signs of serious dyspnoea (decreased dyspnoea d'effort, dyspnoea with speaking, use of respiratory assistant muscles and orthopnoea)
Cancer	1. Patient has a primary tumour with a poor prognosis 2. Patient is moderately disabled; dependent. Requires considerable assistance and frequent care (Karnofsky score ≤50%) 3. There is a progressive decline in physical functioning 4. The patient is progressively bedridden 5. The patient has a diminished food intake 6. The presence of progressive weight loss 7. The presence of the anorexia-cachexia syndrome (lack of appetite, general weakness, emaciating, muscular atrophy) 8. The patient has a diminished 'drive to live'

Appendix 2 – Reminder for proactive planning and disease specific potential problems (Proactive Palliative Care Planning Card, PPCPC) - Problems Square

<table>
<tr><td colspan="2">Somatic domain</td><td colspan="2">Social en financial domain</td></tr>
<tr><td colspan="2">Action plan</td><td colspan="2">Action plan</td></tr>
<tr><td>Actual problems:</td><td></td><td>Actual problems :</td><td></td></tr>
<tr><td>Expected problems:
Scenario of dying:</td><td></td><td>Expected problems:</td><td></td></tr>
<tr><td colspan="2">Care provision and activity of daily living</td><td colspan="2">Existential and psychological domain</td></tr>
<tr><td colspan="2">Action plan</td><td colspan="2">Action plan</td></tr>
<tr><td>Actual problems:</td><td></td><td>Actual problems:</td><td></td></tr>
<tr><td>Expected problems:</td><td></td><td>Expected problems:</td><td></td></tr>
<tr><td colspan="4">Possible future problems
Pain Dyspnoea Ileus Delirium Fear Depression Coma Liver/renal failure
Strain of informal caregiver Special technical care</td></tr>
<tr><td colspan="4">Disease specific interest
CHF : anaemia deactivation defibrillator weight
COPD: medical /non-medical possibilities against dyspnoea</td></tr>
</table>

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6 Timely identification of palliative patients and anticipatory care planning by GPs: practical application of tools and a training programme

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BMC Palliat Care. 2016 Apr 5;15(1):39

Abstract

Background

Palliative care is mainly restricted to terminal care. General practitioners (GPs) are not trained to early identify palliative patients with cancer, COPD or heart failure. With the help of the RADboud indicators for PAlliative Care needs (RADPAC), we trained GPs to identify patients' needs and to make a proactive care plan. They were also able to join two role-plays where they discussed the patient's future, and consulted a palliative care consultant to fine-tune the care plan. We evaluated the programme with the GPs and consultants and noted its impact on their daily practice.

Design

Two years after they had participated in the programme, we held semi-structured interviews with the GPs and a focus group interview with the consultants and performed a thematic content analysis.

Results

Six consultants and nine GPs participated in the programme. Most GPs and consultants mentioned positive changes in the thinking or acting of GPs regarding early palliative care. A number continued to use the tool to identify patients; most of the others noted they had internalised the indicators. Although half of them still considered discussing end-of-life aspects difficult, particularly in patients with organ failure, the others were more easily able to discuss the future with their palliative patients.

Conclusion

Although most GPs and consultants were positive about the training programme and applying it in daily practice, we conclude that in future programmes, more attention needs to paid to timely identification of palliative patients with COPD or CHF and how to discuss the future with them.

BACKGROUND

Palliative care is an approach that improves the quality of life of patients and their families facing the problem associated with life-threatening illness, through the prevention and relief of suffering by means of early identification and impeccable assessment and treatment of pain and other problems, physical, psychosocial and spiritual.[1] This widely accepted WHO definition shows that palliative care should not be restricted to reactive symptom relief and crises interventions. Timely palliative care makes it possible for the patient, the family caregiver and the healthcare professional to anticipate the wishes, future problems and terminal scenarios related to the patient's situation. It improves quality of life and reduces depression and aggressive interventions in the last months of life.[2-4] However, early palliative care has not been widely implemented as the optimal starting moment, model, and structure are poorly defined.

In the Netherlands, most patients in their final stage of life live at home and would prefer to die there.[5] This implies that the general practitioner (GP) should be the coordinator of their care. Several studies report on the tools that have been developed to support the GP in this specific role: an instrument to help GPs stimulate patient-centred communication;[6] a method to improve interaction between GPs and district nurses;[7] and a communication training programme for GPs.[8]

Dutch GPs have requested aids to help them timely identify their palliative patients. In response, we developed the RADboud indicators for PAlliative Care needs (RADPAC).[9] (Appendix 1) In addition, we developed the 'problems square' to help GPs make a structured, multidimensional overview of the patient's current and future problems, needs, and advance care planning (ACP) wishes.[10] (Appendix 2) We then trained GPs in identifying their palliative patients and in delivering structured proactive care. Following the training programme, the GPs were also offered a consultation by phone with a consultant specialised in palliative care for each identified patient. They were able to discuss the draft multidimensional care plan and the communication training with simulation patients.[10] We studied the effects in a randomised controlled trial (RCT) and found no differences between the intervention and control condition in number of contacts with the GP out-of-hours cooperative, hospitalisations, and place of death. Yet, the GPs only identified a quarter of all the palliative care patients who died in the year after the GP training programme. A post hoc analysis showed those patients identified by the trained GPs as needing palliative care, were 25% less often hospitalised in the last three months of life, had more contacts with their GP (13 versus 7.5 contacts), more often died at home (67% versus 45%), and less often died in hospital (14% versus 32%).[11]

To gain better insights into the practical application of RADPAC and the training programme, we explored the views of both the GPs and the consultants who advised the GPs in order to fine-tune the proactive palliative care plan, two years after the GPs had been trained. We asked them to evaluate the tools, the model, and its application in daily practice.

METHODS

Design

A qualitative study nested in the intervention condition of this larger RCT was conducted to get in-depth information of how participants evaluated the RCT's tools and training programme.[11] We used a combination of focus group methods and individual telephone interviews.[12]

Ethical considerations

This study was part of a research project approved by the Research Ethics Committee of the Radboud University Medical Center (2007/205) in accordance with the Medical Research Involving Human Subjects Acts (WMO). It also conformed to the Helsinki Declaration.[13] Oral informed consent was obtained from all participants.

Participants

Participants were (1) GPs who had participated in the RCT[11] and had been trained in timely palliative care two years prior to this study, and (2) consultants in palliative care who had specialised post-academic training in palliative care and with whom the GPs discussed the concept care plan. The main features of the intervention condition are described in box 1.

Focus group interview consultants

All consultants who had been consulted by any of the GPs trained in timely palliative care for a specific patient were invited to participate in a focus group interview. Each of them was asked to complete a questionnaire including demographic variables: gender, age, years of experience work as a palliative care consultant (fte – full time equivalent), and their other profession if they only worked as a consultant part-time.

An interview guide was developed based on the content of the intervention condition and extensive discussion within the project team. Using this guide, we explored: (a) experiences of the consultants in this new role as timely palliative care consultant; (b) the interaction with the GP during the consultations and the identification; and (c) the GP's proactive care planning input. A GP moderated the focus group interview. Those consultants not able to join the focus group meeting were asked to participate in a semi-structured interview by phone.

Box 1 – Main features of the intervention condition

Intervention the trained GPs had received two year before

Two years prior to this qualitative study, the GPs that had been allocated to the intervention condition of a randomised controlled trial had received a five-hour group training in early identification and proactive palliative care planning. During this course, they received and practiced using the following tools developed by our research group:

(1) the RADPAC, a tool with specific indicators to identify patients with COPD, CHF and cancer who might benefit from palliative care, and
(2) a proactive palliative care planning card, the 'Problems Square': a tool designed to help users make a structured proactive care plan in which current and possible future problems (somatic; social and financial; caregiving and activities of daily living; and existential and psychological), dying scenarios, and patient's wishes and needs are considered.

The trained GPs were invited to apply this knowledge and these tools in their daily practice, and thus to identify palliative patients and to develop a proactive palliative care plan for each of them. With regards to each palliative patient the trained GPs identified, they were offered an individual coaching session by phone with a consultant specialised in palliative care. During this session the anticipatory care plan the GP had prepared was discussed, and adapted where needed. Finally, all trained GPs were offered two additional face-to-face peer group sessions in which experiences could be exchanged, and where they could practice with simulation patients to communicate end of life aspects.

The GPs in the control condition had not received any training or intervention.

Telephone interviews with the trained GPs

We selected a convenience sample from the group of the 58 trained GPs and asked them to participate in a semi-structured telephone interview conducted by a trained female medical student. GPs were invited to participate and interviewed until saturation was reached.

The interviewer used a topic list, previously developed by the project team, to explore the GPs' experiences with the training programme in general, identifying palliative patients, with the RADPAC[9] (Appendix 1) and their anticipatory care planning using the Problems

Box 2 – Description of themes and quotes

A		**The training**	
B		**Identification of the palliative patient**	
		1	*"(...) regarding patients with CHF or COPD it becomes a hell of a job. And particularly when it concerns progress in time, that is also difficult. But when it concerns a patient with cancer, you know by and large (...) what is going to happen, and thus how to develop a plan." (consultant)*
C		**Communication with the patient**	
		2	*"But when you consider to start discussing end-of-life aspects, then I realise that such a message will come across the patient as quite a burden. [...] (GP)*
		3	*"I tended to communicate concealed and now I am more straight. (GP)*
		4	*"It is possible to prepare patients, and I am better prepared myself too." (GP)*
		5	*"More than before, I keep an eye on them (...), people of whom you realise that they will not cure anymore, with whom it sooner or later will go wrong, like patients with COPD, CHF, that kind of people." (GP)*
		6	*"It is not just arranging more care, but also assessing what goes wrong or can go wrong and how can I anticipate on that (...) which can result in more care provision, but also in medication, or checking things." (GP)*
D		**Proactive care planning with the problems square**	
		7	*"I mean, as a GP I already did it that way but not as structured as with the problems square. And now it is easy to check did I consider all aspects, as it is sometimes mixed up." (GP)*
		8	*"I really liked the idea [...] to consider prospectively what might occur [...] in the several segments."(GP)*
		9	*"Doing it completely like stated in the protocol asks a lot of time, while many aspects will be addressed during the conversation anyhow." (GP)*
		10	*"With this kind of things, and that probably also counts for the problems square and the RADPAC, there will be a bigger chance that I use it when it is integrated as a protocol in the electronic medical record."(GP)*
E		**Consultant – GP interaction**	
	-		Experiences of the consultant
		11	*"(...), as a consultant, you receive all kind of questions and honestly: I don't know everything from neurology to paediatrics and all other specialties. So, also as a consultant you need dare to say: 'I cannot answer this question, I will consult someone else myself (...)." (consultant)*
		12	*"No, in fact nothing needed to be solved acutely. You could frankly take a helicopter view (...)." (consultant)*
	-		The role of the GP
		13	*"The advantage is, (...) at the moment the GP fills in the problems square and he does it in a conscientious manner, than a lot of the potential future problems are already considered, just by filling in the form..." (consultant)*
		14	*"The GP has a clear picture of the patient and probably knows him quite well. I, on the contrary, only know what has been filled in the problems square." (consultant)*
	-		Interaction between consultant and GP
		15	*"That is my trick, a bit as when you sit down to table (...) and give people room to talk, than you gain a lot more than when you just tick a check box." (consultant)*
	-		Follow up
		16	*"And at the same time, I would be curious whether the proactive suggestions you had provided (...) had landed and thus if the advice had an added value for the GP and probably for the palliative care for that specific patient..." (consultant)*

Square. (Appendix 2) After we received informed consent of each participant, both the focus group and individual telephone interviews were audio-recorded and transcribed verbatim.

Data analysis

We used the software programme Atlas.ti 6[14] for the (Dutch language) thematic content analysis. At first, we divided the transcripts into parts that covered the main aspects of the training and its application (see A through E, box 2). Within each part, two researchers completed the line-by-line coding. They gradually discussed their codes until they reached consensus and the agreed codes were used in the consecutive transcripts; where possible, overarching themes were deduced. They compared the views from both the perspectives of the GPs and the consultants, if applicable. The deductive process, discrepancies and interpretations were regularly discussed within the research team.

Results

The group interview took 1.5 hours. Four of the participating eight consultants worked part-time for one of the Dutch comprehensive cancer centres. Two of them were men and all were aged between 41 and 63. They had between 3 to 9 years' experience as a palliative care consultant. One also worked as a GP, one as an elderly care physician, another as a palliative care consultant at a Radboud university medical center, and one as a teacher in palliative care courses. Two female consultants, a GP and an elderly care physician, were interviewed by phone as they had other commitments at the time of the focus group interview. The number of consultations per consultant performed within the prospective study varied between 1 and 11.

Of the thirteen GPs invited for interviews, nine were willing to participate; three women and six men. Saturation was reached after the seventh interview; during the 8th and 9th interview no new themes emerged.

The mean duration of the interviews was 17 minutes (5-25).

GP evaluation of the training programme

Except for one, all GPs were positive about the training programme: they all mentioned positive changes in their thinking or acting as a result. For most GPs, this meant that their view on palliative care had changed: they were awakened to the fact that many of their chronic patients did not receive palliative care, although it was actually required. The GP who reacted less positively stated that he was already aware of what had been taught and practiced during the training programme.

Identification of the palliative patient with the help of RADPAC

The respondents considered the indicators for timely identification of palliative patients with cancer, COPD or CHF to be clear.[9] Several GPs mentioned that they had integrated the indicators in their daily practice in such a way that they had them in mind and were able to use them directly, although others preferred to trust their clinical experience and evaluation of the patient. Several GPs still found timely recognition of palliative patients with organ failure difficult, despite using the indicators (Box 2, quote 1).

Communication with the patient

When communicating with palliative patients with COPD or CHF, many GPs still found it difficult to discuss end-of-life aspects, as many patients do not realise that their condition is life-limiting and life threatening (quote 2). With regard to communicating the transition from a merely curative to a palliative process with these patients, four GPs did not report any changes as a result of the programme. Two of them noted that they had never experienced any issues with these conversations, implying that the programme had not helped them. Most interviewees stated that they were more aware of, and paid greater attention to identifying patients with advanced stages of chronic conditions and who might benefit from palliative care, (quote 3), and several of them had the impression that communication with these patients had improved (quote 4). One of them mentioned paying more attention to future problems in the communication with his patients after being trained (quote 5). Some GPs observed real differences in how they predicted, communicated about and anticipated future problems; they discussed this more regularly and more proactively with their patients (quote 6).

Proactive palliative care planning with the Problems Square

In general, the interviewees were positive about the Problems Square (Appendix 2). They stated that it helped them consider actual and possible future problems, needs and scenarios regarding all dimensions, and it prevented problems being overlooked (quotes 7-8). A few GPs still used the plasticised chart with the problems square, but most noted that they no longer needed it. The most important reason given for not using the plasticised version was time investment in relation to its added value (quote 9). At least three GPs would highly appreciate a digital version, integrated in the electronic medical record (quote 10). Another GP suggested adding the palliative care plan to the home care file in order to facilitate its use. One GP would appreciate an additional heading 'euthanasia and palliative sedation' in the format, stating that patients often have expectations and wishes regarding these topics, but in many cases neither the GP nor the patient raises them. One GP never used the proactive care plan at all.

Consultant findings

Experiences of the consultants regarding proactive care planning

The consultants considered themselves capable of advising GPs on proactive care planning, however they also mentioned that their knowledge is limited and would like to have better insights into where they can find this missing knowledge (quote 11). They referred to elderly care physicians as being most likely to have expertise on palliative care for patients with CHF or COPD.

Most consultants agreed that a proactive care consultation takes more time than a standard consultation, however, when it is planned and not the result of a crisis, there is more time available (quote 12).

The role of the GP, as described by the consultants

Consultants appreciated the GP completing the problems square format prior to the consultation. In these cases, they noted that the GPs were better prepared and had better insights into the patient's situation as well as the current and the potential future problems (quote 13). Yet, the accuracy and level of details when completing the problems square varied strongly. Often, only one or two 'catchwords' were noted which did not give the consultant a clear picture of the patient and context (quote 14); one consulted noted that the spiritual dimension was often left out.

Interaction between consultant and GP

Communication between the GP and consultant was considered to be valuable. The consultants considered themselves as sparring partners when discussing the scenarios and found it important to leave room for discussion, as this enabled them to dig deeper into the patient's situation and give more detailed advice (quote 15).

Follow up

All consultants would have liked to have had a follow-up contact with the GP to explore which scenario had occurred and to hear what the GP had done with the consultant's advice (quote 16).

DISCUSSION

We evaluated the value of the GP training programme in identifying those patients that might profit from early palliative care, in communicating the future with the patient, and in structuring proactive palliative care. We also evaluated the use of the tools, the consultations, and how this influenced the care they provide.

Most GPs mentioned small changes in attitude and their way of thinking about palliative care and how to provide it. It widened their view on palliative care, and made them realise that patients with chronic diseases might also benefit from its timely initiation. These small changes are in line with the findings from two systematic reviews on educational interventions in the field of palliative care that show that education does have an effect on self-efficacy and attitude of physicians regarding palliative care, but only a limited effect on their daily behaviour.[15,16]

Although the RADPAC indicators that help GPs become aware of those patients that might benefit from palliative care were considered clear, most GPs no longer used the physical tool in their daily practice. However, several GPs stated that they had integrated the indicators in their daily practice. They also noted that they still found it difficult to recognise patients with organ failure who might benefit from palliative care. Other studies report that GPs and medical specialists experience barriers in palliative care provision to patients with COPD or CHF;[17-19] Dutch patients stated that clinicians rarely discussed life-sustaining treatment preferences, prognoses, dying processes, or spiritual issues with them.[19] Many GPs would appreciate a digital RADPAC, fully integrated in the electronic medical record system as has been developed in Scotland, where it was found to be successful in timely identifying palliative patients.[20] These findings are in line with the results of our RCT where only half of the trained GPs actually identified and reported patients who might benefit from palliative care. Of all the trained GPs' patients with cancer, COPD or CHF who died in the year following the training programme, only one of four had been identified.[11] Of the patients who died, a third had COPD and/or CHF, while only 14% had been identified as requiring pro-active palliative care. In a study on timely palliative care in patients with COPD,[21] a clear and 'natural' moment to apply this type of tool was noted as being an event like acute hospitalisation.

Some GPs still considered it difficult to start a conversation on anticipatory care with their patients with COPD or CHF. This is in line with a study by Janssen *et al*., which showed that most patients with COPD did not realise that they had a life-threatening disease, and that many of them do not feel that they are ready to talk about end-of-life issues.[19] In addition, the disease progress of COPD is often unpredictable, which can substantially hamper GPs in shared decision-making about future care options and needs.[22] Earlier studies report that barriers for end-of-life discussions with patients with organ failure appeared to be lack of time and lack of communication skills.[19,23] Uncertainty about the course of the disease contributes to a 'prognostic paralysis', meaning that the GPs do not feel the urge to discuss end-of-life aspects with these patients. In contrast, most of the group of interviewees mentioned that it was currently easier to communicate, and that this better prepared them for proactive care planning in the future. Not all of the GPs interviewed joined the addi-

tional training sessions in which they could practice communication with simulation patients. We expect that those who had practiced with simulation patients who are in these kinds of conversations to feel more confident, as role-playing is an effective way of increasing communication techniques as well as doctors' satisfaction about their communication skills.[15,24]

With regard to the proactive palliative care planning aspect of the training, most GPs stated that the Problems Square was valuable for structuring the inventory of actual and possible future problems, needs and wishes. This is in line with the findings of a questionnaire we sent to all GPs who participated in the trial, one year after the start of the RCT. Of the responding GPs, the trained GPs noted twice as often as the untrained GPs that they had conducted a multidimensional problems and needs assessment with the palliative patients they had at that moment.[25] Only a few still used the plasticised chart; the others said they had internalised it.

Consultation

Although the consultants considered themselves capable of being a sparring partner for the GPs with regard to proactive palliative care planning, they were unable to answer each question. They stated that they needed to know where they could retrieve knowledge themselves if in doubt, or when they lacked the expertise; they also admitted needing extra training themselves with regard to proactive palliative care for patients with COPD or CHF. As we did not record the consultations between GPs and consultants, we cannot objectively evaluate how proactive the consultants' advice was. The fact was noted that an anticipatory consultation takes them more time than a 'normal' consultation for acute problems in terminal patients. Yet, if anticipatory consultations are planned at a convenient moment, this extra time investment was not considered a problem, as it may even prevent acute consultations at a later stage.

The consultants were positive about the preparations the GPs had made prior to the consultation: the GP is the only person who can provide the complete picture of the patient, and the consultant is dependent on what the GP mentions. However, the consultants stated that the GPs only noted a few catchwords in the Problems Square, and often did not prepare the spiritual dimension. Our analysis shows that the combined spiritual/psychological dimension was only explored in about 40% of the patients, but this was twice as often as the results of a large Dutch prospective study of untrained GPs (paper under review). In this study, consultants also appeared to be better able to identify spiritual and psychological problems using problem clarification.[26] The EAPC taskforce on spiritual care in palliative care has the objective of improving this aspect of palliative care.[27] In the Netherlands, a nation-wide guideline on this subject has been published, of which an English translation

is available.[28] Finally, the consultants would appreciate a systematically planned second consultation with the GP about the same patient, to evaluate the effects of their advice.

Strengths and weaknesses

This study provides insights into how those GPs trained in timely identification of patients in need of palliative care and in anticipatory care planning, perceived its value after two years. Although several studies have evaluated the effects of educational interventions on palliative care, the quality of those studies is often poor, and often restricted to short time effects.[15,16,29] With the help of the results of this qualitative study, future training modules in timely palliative care can be adapted to be more in line with GPs' needs.

A strong point of this study is the triangulation: we interviewed both the GPs and the consultants. Studying a topic from different viewpoints gives a more complete image of the topic and increases its internal validity.[30]

The study has a number of weaknesses. It became clear that many patients were under care of a hospital specialist who did not apply proactive palliative care. This means that the process of planning proactive palliative care is challenged; the GP misses natural trigger moments to apply RADPAC. Another fact was that our training programme did not provide an instruction on when to initiate joint primary-secondary care, or when to move back to primary care. This hindered identification and proactive care planning.

We used a convenience sample of GPs. In addition, we did not ask the GPs to evaluate the consultation, which means that this aspect of the intervention was only evaluated by the consultants. Given the range in the number of consultations held by the consultants, those with more consultations will have contributed more to the discussion than those who with less experience. We did not analyse whether participant demographics like age, years of experience or gender, influenced our findings.

As the interviews took place two years after the initial training sessions, it is likely that the GPs would not be aware of exactly what they had learned during the programme and what they had learned via other channels in the same period. Another potential weakness is that only four consultants took part in the focus group interview, although in the two phone interviews held after the group interview, no new information was revealed, indicating that saturation had been reached. Finally, we only interviewed a limited number of GPs and consultants, which means that we were unable to find differences regarding socio-demographic characteristics of the participating GPs and consultants.

CONCLUSIONS

Two years after being trained in providing timely palliative care, GPs were still able to mention positive changes in their daily practice. They also noted difficulties initiating palliative care with their patients with organ failure, as they were still hesitant to discuss end-of-life aspects with these patients. This information has been used to optimise the training programme for GPs and consultants in this field. Aspects that required more attention in the training programme were (1) the use of a 'natural' marking moment such as information transfer between primary and secondary care or hospitalisation; (2) how to communicate end-of-life aspects with these patients; (3) To pay more attention to completing all the domains of the Problems Square, and (4) holding consultations with a palliative care expert to discuss and evaluate the proactive care plan.

Finally, we also recommend integrating identification and advance care planning tools in the GPs' electronic medical record system.

ACKNOWLEDGEMENTS

We would like to thank all the GPs and consultants who took part in the interviews. We would like to thank Aletta Moelands, Sanne Heijmans (medical students who conducted the interviews) and Eric van Rijswijk (GP; focus group moderator).

Appendix 1 – The RADboud indicators of PAlliative Care needs (RADPAC)

Congestive Heart Failure	1. The patient has severe limitations, experiences symptoms even while at rest. Mostly bedbound patients. (NYHA IV) 2. There were frequent hospital admissions (>3 per year) 3. The patient has frequent exacerbations of severe heart failure (>3 per year) 4. The patient is moderately disabled; dependent. Requires considerable assistance and frequent care (Karnofsky score ≤50%) 5. The patient's weight increases and fails to respond to increased dose of diuretics 6. General deterioration of the clinical situation (oedema, orthopnoea, nycturia, dyspnoea) 7. The patient mentions 'end of life approaching'
Chronic Obstructive Pulmonary Disease	1. The patient is moderately disabled; dependent. Requires considerable assistance and frequent care (Karnofsky score ≤50%) 2. The patient has substantial weight loss (±10% loss of bodyweight in six months) 3. The presence of congestive heart failure 4. The patient has orthopnoea 5. The patient mentions 'end of life approaching' 6. There are objective signs of serious dyspnoea (decreased dyspnoea d'effort, dyspnoea with speaking, use of respiratory assistant muscles and orthopnoea)
Cancer	1. Patient has a primary tumour with a poor prognosis 2. Patient is moderately disabled; dependent. Requires considerable assistance and frequent care (Karnofsky score ≤50%) 3. There is a progressive decline in physical functioning 4. The patient is progressively bedridden 5. The patient has a diminished food intake 6. The presence of progressive weight loss 7. The presence of the anorexia-cachexia syndrome (lack of appetite, general weakness, emaciating, muscular atrophy) 8. The patient has a diminished 'drive to live'

Appendix 2 – Reminder for proactive planning and disease specific potential problems (Proactive Palliative Care Planning Card, PPCPC) - Problems Square

<table>
<tr><td colspan="2">Somatic domain</td><td colspan="2">Social en financial domain</td></tr>
<tr><td colspan="2">Action plan</td><td colspan="2">Action plan</td></tr>
<tr><td>Actual problems:</td><td></td><td>Actual problems :</td><td></td></tr>
<tr><td>Expected problems:
Scenario of dying:</td><td></td><td>Expected problems:</td><td></td></tr>
<tr><td colspan="2">Care provision and activity of daily living</td><td colspan="2">Existential and psychological domain</td></tr>
<tr><td colspan="2">Action plan</td><td colspan="2">Action plan</td></tr>
<tr><td>Actual problems:</td><td></td><td>Actual problems:</td><td></td></tr>
<tr><td>Expected problems:</td><td></td><td>Expected problems:</td><td></td></tr>
<tr><td colspan="4">Possible future problems
Pain Dyspnoea Ileus Delirium Fear Depression Coma Liver/renal failure
Strain of informal caregiver Special technical care</td></tr>
<tr><td colspan="4">Disease specific interest
CHF : anaemia deactivation defibrillator weight
COPD: medical /non-medical possibilities against dyspnoea</td></tr>
</table>

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7 Discussion

In this chapter the main findings of our studies are discussed and also put into a broader perspective. Strengths and weaknesses are discussed and recommendations for clinical practice, education and training and research are given. Finally, I end with a more general societal discussion on the topic of my thesis "Early proactive palliative care in general practice: identification, communication and structured planning".

In order to improve palliative care for patients with incurable, life limiting diseases, the World Health Organisation (WHO) stated already in 2002 that palliative care should be initiated in an early phase of the disease.[1] An early start facilitates anticipatory palliative care in order to meet patients' wishes and needs, to relieve symptoms and to prevent future symptoms and problems.[2-4] Regardless this WHO recommendation, palliative care is often limited to a reactive approach, to relieve physical symptoms in the terminal phase and to patients with cancer. The GP, being the most appropriate professional to coordinate palliative care for home-dwelling patients, have expressed a need for guidance on how to recognise patients in need of palliative care and on how to structure anticipatory palliative care.[5,6]

Therefore, we developed an intervention which consists of a training for GPs in using the RADPAC[7] as an aid to identify those patients that might profit of proactive palliative care, and in planning and providing proactive palliative care. By means of a cluster randomised controlled trial we studied the effect of this intervention on the following outcome measures: number of out-of-hours-contacts, number of contacts with the patients' own GP, number of hospitalisations and place of death.

Fifty-nine GPs were included in the intervention group and received the intervention while the control group of 79 GPs did not receive the intervention and were asked to provide care as usual. The intervention[8] consisted of three separate parts:

1. a five hour group training in early identification of patients who can be considered as being palliative patients, by means of the RADPAC, and in proactive palliative care planning;
2. an individual telephone coaching session per identified palliative patient with a physician specialised in palliative care to discuss the proactive care plan, and
3. two peer group sessions with the GPs with a focus on patient-GP communication regarding the intention of a palliative care trajectory.

In the RCT we did not find any differences in outcome between intervention and control group, in the number of contacts patients had with the out-of-hours GP cooperative, the number of contacts with the patients' own GP, the number of hospital admissions, nor differences in place of death.

However, in the intervention group only 24% of the patients that died during the study period had been identified as in need of palliative care. And the patients that had been identified were identified by only half of the GPs in the intervention group. We performed a post-hoc analysis in which we studied the same outcomes regarding those patients that had actually been identified by the intervention group GPs in comparison to all other patients from intervention and control group. This post-hoc analysis showed that identified patients had more contacts with their own GP and less hospitalisations in the last months before death, they more often died at home (not statistically significant) and less often in hospital.[9] Despite the negative outcome of the RCT, this post-hoc analysis seems to indicate that the intervention has the potential to improve different aspects of the quality of palliative care in primary care.

Given this potential positive effect, what might be reasons that GPs aren't capable to routinely practice proactive palliative care?

This intriguing question is by no means easy to answer, but in our study we gain some insights which can be useful in further developing the complex concept of proactive palliative care.

First of all, the concept of early identification. Although we strived for 'early' identification of palliative care needs, the indicators of the RADPAC we developed seemed to be related to quite advanced or final stages of the three studied diseases: cancer, COPD and CHF. A possible explanation for this mismatch between aim of the RADPAC indicators and result might be that at the start of our study, the concept of 'early identification' was not at all widely integrated in the Netherlands.[10-12] As an example, many of the experienced participants of the focus group interviews, one of the methods we used in the development of the RADPAC, struggled with the interpretation of terms and concepts like 'terminal care', 'end-of-life care', 'advance care planning' and 'palliative care'.

Secondly, the RADPAC only contains somatic indicators, except for one, and therefore lacks connection to one of the pillars of general practice: the context of the patient.[13,14] In an interview study Claessen *et al*. found that GPs identify palliative patients via hospital discharge letters and specific signals like increased care dependency from others, not completely recovering of an intercurrent disease, signals from family caregivers, home care providers or medical specialists.[15] Considering this, we might conclude that triggers that helping to identify palliative patients don't need to be disease-specific. Such 'natural highlighting moments' might be easier to apply as identification aids, as they are closer to daily practice. In the past few years, parallel to my research, in several other European countries palliative care needs identification tools for general practice have been developed. Maas *et al*. compared seven

of such tools.[16] At the moment of this review, none of them were validated. Six tools were developed specifically for primary care, although SPICT (also in Dutch)[17] and NECPAL-CCOMS-ICO can also be applied in hospital settings. Most tools start with the surprise question: '*Would I be surprised if this patient died in the next year?*' which appeared to be useful for GPs in identifying palliative patients with cancer[18], but not for patients with COPD, CHF[19] or frail elderly.[20] Only the SPICT, an identification tool from Scotland, starts with a kind of 'natural', generic indicators for deteriorating health.[21] Another reason why such a generic method might fit better in general practice, is that a large part of this patient population has multimorbidity, which hampers application of a disease-specific tool. General indicators specifically for primary care might be 'diagnosis of an incurable, life-limiting disease', or hospital discharge after such a diagnosis, but also the combination with non-disease specific complicating factors in the patient or family history in the physical, social, emotional or existential domains. Examples might be being single, suffering from anxiety or depression, or having a family caregiver with a cognitive impairment or who is overburdened.[22]

Thirdly, an identification tool is not enough to facilitate GPs to timely identify the palliative care needs of their patients. In addition, other steps must be taken to raise awareness among other health care professionals about the fact that patients with a potentially life-threatening illness can benefit from an early start of palliative care alongside disease modifying treatment (curative treatment or life prolonging therapy),[2,23,24] as defined in the definition of palliative care by the WHO.[1]

As long as medical specialists continue to follow up their patients who actually are in a palliative phase but are not yet identified as such and with whom the advantages of proactive palliative care have not been discussed, it is very difficult for GPs to take this role. Particularly for other medical specialists than medical oncologists, (e.g. cardiologists, pulmonologists) considering any of their patients for a palliative care program is no common practice.[25,26]

Similar to GPs, medical specialists should also timely identify and discuss proactive palliative care, as patients often already have a long-lasting (disease orientated) relationship with them and therefore trust them. However, like GPs, also medical specialists struggle to define the moment to start palliative care.[27] In our research group, identification of patients with COPD by medical specialists is currently being studied in a prospective, controlled study.[28] Up to now, disease-specific clinical practice guidelines hardly provide clear recommendations on how to early identify palliative care patients and on proactive care planning.[29-31]

Sharing a Key Information Summary (KIS) is another practical application, although not yet widespread. A recent study of Tapsfield *et al*. showed that using KIS, a shared electronically and updated real time system in which GPs and other care providers can routinely share the anticipatory care plans, 60% of the patients were identified[32]. Within this group of identified patients, the percentage of patients with cancer was the highest (75% identified) and that

of patients with chronic organ failure the lowest (41% identified). Particularly in the latter group, the medical specialist continues to be the main professional caregiver, which implies that often the GP is not aware of the condition of the patient or not in a position to provide palliative care until the final phase, which is a missed chance for all stakeholders.[27,33,34] Shared care between primary and secondary care appeared to be successful in the treatment of chronic diseases;[35,36] we are currently pilot-testing shared palliative care in several initiatives in our region, but also in other parts of the Netherlands.

Lastly, even when they had identified the patient, the GPs experienced barriers to start discussing proactive palliative care with the patient and his family. In our study, GPs reported to be reluctant, fearing to take away all hope of their patients, and to experience difficulties with choosing the right moment to start discussions about the future. This is in agreement with several other studies.[37-39] Besides, Weeks *et al*. showed that patients are more satisfied with the communication of doctors who give unrealistic positive information about the effects of chemotherapy than of those who give realistic information.[40] However, Green showed that discussions about the end of life don't have to take away hope.[41] Additionally, patients want their GP to talk openly and honestly about relevant end-of-life issues.[42,43] What also needs to be taken into account is that GPs who experienced barriers in discussing the future had already identified the respective patients as being palliative; all patients that were not identified at all lacked such discussions anyhow.
Several training methods can help GPs and medical specialists to initiate such conversations about future care and the end of life.[44,45] A recent review on communicating future illness progression and end of life provides some guidance.[46] The authors concluded that there are different ways to initiate talking about feelings and plans in relation to end of life. Posing a hypothetical question strongly encourages on-topic talk, while indirect references to the difficult issues form a more gentle way of 'pushing at the door' of the topics, which some patients take up and some deflect. Despite the WHO definition of palliative care and the intention of professionals, the general public still mainly associates palliative care with the terminal phase and dying.[39] Therefore more effort is needed to raise public awareness of the concept of palliative care. Or, as an alternative solution, a new term should be considered that better describes the intention of proactive palliative care, namely 'anticipatory care' or 'supportive care'.[47] These terms refer to the supportive character, to the treatment goals aiming to relieve symptoms and to increase quality of life, to information exchange between professionals, but without the direct association with a terminal phase or dying. This is also in line with the fact that anticipatory care, in contrast to advance care planning, aims to anticipate on all future care needs, not just regarding the end of life. By not directly relating this kind of care to the end of life, hope is not immediately shatterd, and the trustful patient-doctor relationship not threatened, which to my experience will facilitate good care provision.

Our study (chapter 5) showed that GPs in the intervention group more often provided multidimensional care, with particularly more attention for the spiritual and psychosocial domains than GPs in the control group. This is an important finding, as Evans *et al*. showed in their study that the spiritual and social domain did not get enough attention in their study.[48] This result is likely related to the training we used and to practicing with the Proactive Palliative Care Planning Card (PPCPC) that structures GPs discussion with the patients and their informal caregivers, and help to explore patients actual and potential problems and needs on the different palliative care domains (Figure 1). The name of the PPCPC changed during the research into a less difficult name, Problems Square. This Problem Square, in combination with the training with simulation patients, will have contributed to this positive finding.

STRENGTHS AND WEAKNESSES

This is the first thesis that systematically studied the effect of training GPs in identifying patients in need of palliative care and in providing proactive palliative care and that evaluated long-term effects of this training. Another strength is the large number of GPs that was included in a short period of time. This shows their large interest in palliative care and a strong need for education and skills training. However, only 57% of the included GPs completed the questionnaire with data of deceased patients, one year after start of the intervention. Therefore we missed the data of the deceased patients of the non-responding GPs. The response rate of the survey in chapter 5 was even lower. Probably, only the very motivated GPs have responded. For those reasons, the results should be interpreted with caution.

When we started our study, the Prognostic Indicator Guide (PIG) as part of the Gold Standards Framework (GSF) already existed.[49] In fact, our study was inspired by the GSF. However, at that time the indicators of the GSF were not evidenced-based. In 2008, Qaseem *et al*. did not identify any evidence-based validated identification tools that were able to mark the optimal timing to initiate palliative care[50], even though all kind of studies looked at prediction of mortality, at survival and prognostication. We aimed to develop an evidence- and practice-based tool. We succeeded in reaching that aim, although validation was restricted to face-validation (expert opinion).

However, the study also has several weaknesses. In chapter 4 we used place of death as one of the outcome measures, as dying at the preferred place, which mostly is at home, is considered a quality indicator for palliative care.[51] However, dying at home is not always the best place, for example when a patient has no family or friends to take care of him. Besides, the preferred place of death can change over time.[52] De Roo *et al*. found a strong correlation between death at home and preferred location of death,[53] which affirms that location of death might have been, within the study design, a good and realistic outcome variable. Ideally, quality of life would have been the primary outcome. But, as the GPs in the control group

Figure 1 - Reminder for proactive planning and disease specific potential problems (Proactive Palliative Care Planning Card, PPCPC) - Problems Square

Somatic domain		**Social en financial domain**	
Action plan		Action plan	
Actual problems:		Actual problems :	
Expected problems: Scenario of dying:		Expected problems:	
Care provision and activity of daily living		**Existential and psychological domain**	
Action plan		Action plan	
Actual problems:		Actual problems:	
Expected problems:		Expected problems:	
Possible future problems Pain Dyspnoea Ileus Delirium Fear Depression Coma Liver/renal failure Strain of informal caregiver Special technical care			
Disease specific interest CHF : anaemia deactivation defibrillator weight COPD: medical /non-medical possibilities against dyspnoea			

did not have the RADPAC for palliative patient identification, we would not have been able to collect comparable data in the control group. In a currently ongoing study on proactive palliative care in patients with COPD, patients are included during a hospitalisation for an acute exacerbation, which allowed for prospective collection of patient data in the control group as well as the intervention group.[28]

The positive findings described in chapter 4 were restricted to the post-hoc analysis, which was not described in the study protocol.[8] Identified patients had more contacts with their own GP, less hospitalisations, more often died at home (67%) (although not statistically significantly) and less often died in hospital (14%). We don't know whether these positive findings are related to the intervention, or caused by the fact that this identified group of patients differs from the other patients (age 64.8–74.6, male 61%-54%, cancer 86%-66%). It is known that various factors influence death at home.[54-56] In a recent Dutch study concerning place of death of home-dwelling patients that died after a protracted terminal illness, 52.5% of

the patients died at home.[53] In a study that only concerned patients with cancer 29.4% died in hospital,[57] and a study concerning Dutch patients with diseases being indicative of palliative care needs, 25% died in hospital.[58] We consider the significant lower percentage of hospital deaths (14% versus 32%) as a more relevant outcome measure than an increase of home death, as dying in hospital is often related to a crisis and thus undesirable. Besides, dying in a hospice or in a nursing home can also be a preferred place and a chosen alternative of dying at home.

Regarding the outcome measure 'hospitalisations in the final 3 months of life' we were not able to make a distinction between unplanned and planned hospitalisations, as an intervention within proactive palliative care, for example for palliative radiation therapy or for inserting a double J catheter in an obstructed ureter. In order to use this outcome measure in the future, the reason for hospitalisation and if the hospitalisation is planned or unplanned needs to be assessed.

RECOMMENDATIONS

Recommendation for general practice

In general, GPs in the Netherlands perform well in comparison with other developed countries concerning the low percentage of patients with cancer that die in hospital,[57] as well as concerning discussing end-of-life aspects.[48] However, the delivery of palliative care according to the WHO definition is not optimal yet. GPs should also become aware of patients with non-malignant diseases that might benefit from proactive palliative care. Therefore, we recommend GPs to identify palliative patients with the SPICT-NL,[17] and to involve their practice assistants and nurse practitioners in this identification process. It is not always the GP herself who sees the patient or his family, who sees the discharge information, or who has contact with home care, but this can also be another professional within the primary care practice. Besides, the contact of the GPs practice assistant or the nurse practitioner with the patient or family differs from the contact the GP has: they might see relevant aspects that can help the GP to identify palliative care needs. Hence demonstrating the advantages of a primary care team approach.

For proactive palliative care planning, we recommend using the Problems Square to make a structured, multidimensional actual and future problems and needs inventory. GPs are, more than any other health care professional, familiar with 'consultation'; also in palliative care this can contribute to high quality palliative care provision. In the Netherland, 24/7 free of charge palliative care consultation managed by professionals trained in palliative care is available for GPs, as a service of the Netherlands Comprehensive Cancer Centre (IKNL).

I recommend GPs to use this consultation opportunity also proactively for discussing the different future scenarios.

To learn from each other within the primary care team, we recommend evaluating each deceased patient with all stakeholders. In this way, the care for not only the patients that actually did receive proactive palliative care, but also for those who unintentionally did not is considered.[59]

Recommendations for education

Upon graduation, every medical doctor is required to pledge a medical oath, based on Hippocrates. It states that a physician takes care of the ill, promotes health, relieves suffering and does no harm. Most medical students start their education with the idea that a doctor cures people. It would be an enrichment if their educational program would give more attention to the last part of the oath, relieving suffering in patients with chronic, incurable diseases that might benefit from proactive palliative care.[60] By implementing this topic early in the educational programme of medical students, young doctors will realise from the beginning that not being able to cure a person does not imply that the doctor fails, and that there are all kind of options for delivering good care to, and even for increasing the resilience of, chronically ill persons. Also specific training in communication about the future perspectives of a patient and his proxies needs more attention. In our university medical hospital, a new medical curriculum started in 2015, in which more attention than before is given to palliative care, pain management and communication training, which is an excellent step in the right direction.[61] Besides, a research project has started recently, financed by the Netherlands Organisation for Health Research and Development (ZonMw) within the Dutch national programme for palliative care 'Palliantie'. In this project all university medical expertise centres for palliative care are involved and together they aim to realise more attention for palliative care for all medical students by developing specific educational tool kits. We hope that early identification of palliative patients and proactive palliative care planning will be part of this, as each medical professional should have basic knowledge about palliative care and should know where to refer to for complex palliative care.

Recommendations for research

Despite our efforts and those of others, early identification of palliative patients still remains problematic. Therefore, we recommend that individual research groups from all over the world studying early identification of palliative patients start a global collaboration group in order to develop, validate and implement one international tool. The EAPC primary palliative care steering group, led by professor dr. Scott Murray, would be a good choice to foster such a group, as the developers of several identification tools are members of this group. Initiatives to identify frail elderly and to improve their care certainly have similarities with

the aspects of palliative care described in this thesis. I therefore suggest cooperation between researchers in this field.[62] We also recommend to further explore barriers experienced by both GPs and patients in discussing palliative care issues together by qualitative research, for example with a narrative approach.[63,64] Next, continuity of care between primary and secondary care settings regarding proactive palliative care is an important research topic. I recommend to study barriers, facilitators and cost-effectiveness of integrated care pathways involving optimal palliative care parallel to disease-orientated care.

GENERAL SOCIETAL DISCUSSION

The intervention we developed was meant for GPs. However, I have the opinion that information about palliative care still needs to be widely spread in the society. Today, health care and health care insurance companies almost completely focus on the curative intention of treatments; as if life would be malleable as well as death.[65] The media focuses equally on this in for example a documentary about a patient with severe heart failure who receives an artificial heart while waiting on a heart transplantation. Or the website of the Dutch Royal Cancer foundation (KWF) that states: 'giving up is no option' and that states that all cancer can be cured within a few decades.[66]

In my opinion, societal discussion regarding the final phase of life should concern quality of life and quality of dying. Care that is congruent with the wishes, the life, the context of the patient and his family: palliative care. Thankfully, small steps in this direction have been made recently. In March 2015 a report was launched titled 'not everything that is possible needs to be done' in which society, patients, their family and physicians are informed and strengthened in making their own choices timely, in making choices that are not always primarily or solely driven by choices for life prolongation.[67]

On the governmental website Kiesbeter.nl, meant as a monitor with information about quality of care provision in individual settings all over the Netherlands,[68] palliative care and discussing patient's own wishes with the GP is often mentioned as a move in the right direction. Generally, patients seem only marginally informed about the spectrum of palliative care. Society and most patients only consider euthanasia as an end-of-life topic to discuss with their GP by statements as: 'Doctor, if my life is not more than that of a hothouse plant, I want to have an injection', and hardly or not at all about palliative care options. This stresses the need for good information and patient education on early identification, and proactive palliative care. All health care professionals, as well as the government, health care insurance companies and media have an important role in enhancing this knowledge.

Until now, euthanasia receives a lot of attention in the national and international media, which gives the wrong impression that this is the only and preferred way of dying in the

Netherlands. In fact, 97% of the Dutch citizens die without euthanasia.[69] Patients, at all ages and all kind of stages of their lives, should be informed better about, and stimulated to consider and discuss the different aspects and choices regarding end-of-life decisions and possibilities including good palliative care. The palliative care expertise centres of the Dutch academic hospitals, the IKNL (Integraal Kankercentrum Nederland; Netherlands Comprehensive Cancer Centre), Palliactief (Dutch multiprofessional association for professionals in palliative care), Agora (Dutch organisation that serves as a platform for the exchange of information on end-of-life issues) and patient organisations all have an important role in educating the general public on what palliative care intends and can do for patients and their proxies. This all together will facilitate patients, their family, GPs and medical specialists to discuss the possibilities of proactive palliative care.
Quality indicators used in general practice and in hospitals mostly measure aspects of care that are related to diagnosis, curation or disease improvement.[70,71] For example, regarding the care for patients with COPD such indicators are the percentage of conversations about smoking cessation, the percentage of patients receiving spirometry in the last month, or the percentage of patients for whom functioning in the past 12 months has been documented in a structured way. Up to now, no obligatory quality indicators exist that measure 1) if a conversation about end of life has taken place, 2) if shared decision making was used about quality of life related decisions and 3) if it has been discussed and documented whether an incurable patient still wants to be hospitalised. If such quality indicators would be implemented, health care professionals would emphasize that accepting the boundaries of malleability of life can result in good care.

Recently, the State Secretary for Health, Welfare and Sports, Van Rijn, stated that financing and rules on indications for receiving specific care or to be refered to a specific setting (like a hospice) should and may not hinder the choice for the location of death, as all health care insurers have the obligation to provide adequate end-of-life care.[72] Health care insurers make a distinction between palliative care and palliative terminal care, and Health Insurers Netherlands (Zorgverzekeraars Nederland) state that everyone who needs it will receive palliative terminal care.[73] However, until now, no specific financial reimbursement exists for proactive palliative care, although it has been shown that patient-centred palliative care at home for patients with CHF is cost-effective.[74] Therefore I advocate remuneration of proactive palliative care by the GP: by providing this, less patients will die in a hospital which might be cost-effective. As palliative care currently is on the agenda of the government and politicians, the time seems ripe to study cost-effectiveness of proactive palliative care.

Since 2015, health care is strongly reorganised in the Netherlands with a transfer of the responsibility for organising long term health care support from the central government towards the insurance companies and municipalities.[75] At the same time, the coordinating

role of family caregivers and volunteers has become more important as a result of a decrease in central governmental support of professional care. Besides, municipalities became responsible to organise, support and arrange cleaning personnel at home as well as for specific support for family caregivers when they are not able to provide care themselves. The district nurse provides professional nursing care at home, like dispensing medication or assisting the patient in taking a shower. Together with the municipality the nurse decides what kind of care and support is needed. This seems logical, but when it concerns proactive palliative care it is not only a manner of checking what is necessary at that moment, but also to anticipate on future care needs. Realising this will need a paradigm shift in home care organisations, in municipalities as well as in health care insurers and in the government. And last but not least, this needs a higher level of awareness among the general population too.

GENERAL CONCLUSION

This dissertation provides insights in the effects of and barriers to early identification of palliative patients and proactive palliative care planning by GPs. Training GPs in early identification of palliative patients and proactive palliative care planning looks promising. And when barriers that hamper patient identification or GP/patient communication about future care are overcome, such proactive care planning will certainly contribute to the improvement of the quality of palliative care in the Netherlands.

Finally, the story of Mr Roos, receiving ideal proactive palliative care.

Mr Roos 80 years old, known for years with congestive heart failure. About ten years ago, when his cardioverter defibrillator (ICD) was implanted, the cardiologist in whom he and his wife have great confidence, discussed the progressive illness with Mr. Roos, and that somewhere in the future this ICD needed to be deactivated. Although his condition slowly declined, he had a good life, with regular consultations with his cardiologist, the heart failure nurse, and his GP.

Recently, he had an acute exacerbation of his heart failure, and he felt that he lost the resilience to completely recover. Again, the cardiologist told him that he is not able to help him recover to his previous condition, but that he, together with the GP, will provide optimal comfort care to him: palliative care. He also suggests to him and his wife to make an appointment with their GP, and tells them that he will inform the GP by phone and by mail about his condition.

In the next months, Mr and Ms Roos regularly have an appointment with their GP to talk about all kind of things: about his son who builds a green house, about his progressive dyspnoea, about his fear for choking and leaving his wife behind, about her fears and mood, and their wishes about the end of his life. They also talk about home care to assist him with his activities

of daily living and to monitor Mr and Ms Roos. Once in a while the practice assistant phones Ms Roos, and asks her how she is coping.

The Gp as well as the cardiologist empower the family. Mr Roos regularly visits the hospital day care. The interval between these visits becomes shorter and shorter, but Mr Roos still finds his life worth living. After a period in which he went to hospital day care weekly for management of fluid overload, in a shared decision making process of the GP, the cardiologist, Mr Roos and his wife, it is decided to inactivate the ICD, and to extend home care. The next day Mr Roos becomes tired, dead tired, and very short of breath. Medication does not provide relief anymore. He says farewell to his wife, his children and his life.

To relief his intractable symptoms, he is sedated and dies at home amidst his wife and children. The GP informs the cardiologist of the death of Mr Roos and they evaluate his trajectory. In the next multidisciplinary primary care team meeting the GP, the practice assistants and home care also evaluate the trajectory of Mr and Ms Roos.

In the weeks after Mr Roos died, the GP sees Ms Roos twice. Around All Souls' Day, Ms Roos receives a hand-written postcard from the GP and practice assistants to give her and her late husband a moment's thought.

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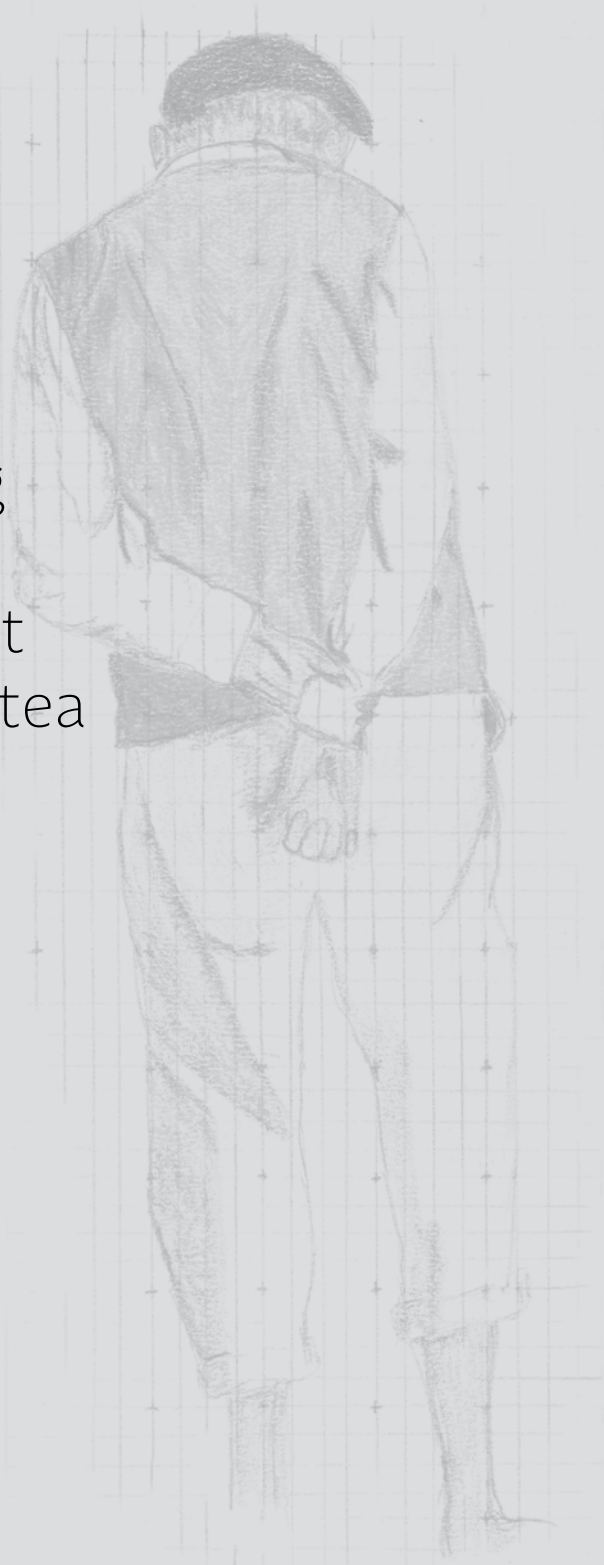
8

Summary
Samenvatting
Dankwoord
Publication list
Curriculum Vitea



SUMMARY

In **chapter 1**, the rationale for this thesis on early identification of and anticipatory palliative care planning for patients in general practice is explained. In 2002 the World Health Organisation (WHO) already stated that palliative care should be available for all persons who suffer from cancer or other life-limiting chronic diseases, in an early stage of the disease, alongside the usual disease-modifying care. However, when this research project was started in 2008, palliative care was still mainly limited to terminal, reactive care for patients with cancer.

In this chapter, we explain why we have focused on training general practitioners (GP) in early identification and proactive care planning. Being the gatekeeper of care, and often working from a long lasting relationship with the patient and his family, the general practitioner seems to be the most appropriate professional to coordinate the care for patients with advanced stage of cancer, chronic obstructive pulmonary disease (COPD) or congestive heart failure (CHF), especially considering that most of these patients live at home and home is their desired place for dying.

In **chapter 2** the development of a tool to help GPs identify patients with cancer, COPD or CHF that might profit of palliative care, is reported. No validated tools predicting the optimal timing for initiating palliative care had been determined previously. We used a three-step procedure, including a literature review, focus group interviews with input from the multidisciplinary field of palliative healthcare professionals, and a modified Rand Delphi process with GPs. The three-step procedure was used to develop sets of indicators for the early identification of CHF, COPD, and cancer patients who could benefit from proactive palliative care.

This resulted in the RADboud indicators for Palliative Care needs (RADPAC), three comprehensive sets of indicators to support GPs in identifying patients with CHF, COPD, and cancer in need of palliative care. For CHF, seven indicators were found: for example, more than 3 hospital admissions. For COPD, six indicators were found: such as, Karnofsky score ≤50%. For cancer, eight indicators were found: for example, worse prognosis of the primary tumour.

We concluded that RADPAC was the first tool developed from a combination of scientific evidence and practice experience that can help GPs in the identification of patients with CHF, COPD, or cancer, who are in need of palliative care. Applying the RADPAC facilitates the start of proactive palliative care and aims to improve the quality of palliative care in general practice.

In **chapter 3** the study protocol of the randomised controlled trial is provided and explained. An early identification of patients who can benefit from palliative care to enable proactive

palliative care might increase the quality of their remaining life. However, at the moment we started this study, this was no common practice and had hardly been addressed in scientific literature. Still, palliative care was mainly limited to the terminal phase and restricted to patients with cancer. Therefore, we wanted to train GPs in identifying palliative patients in an earlier phase of their disease trajectory and in delivering structured proactive palliative care. The aim of our RCT was to determine if this training could improve different aspects of the quality of the remaining life of patients with severe chronic diseases such as COPD, CHF and cancer. A two-armed randomised controlled trial design was chosen. The following outcome variables were studied: place of death, the number of hospital admissions and the number of GP out of hours contacts. We expected that this study would increase the number of identified palliative care patients and improve different aspects of quality of palliative care. This is of importance to improve palliative care for patients with COPD, CHF and cancer and their informal caregivers, and to empower the GP. In this chapter the study protocol is described and possible strengths and weaknesses and consequences have been outlined.

In **chapter 4**, the results of the RCT as mentioned in chapter 2, are described. Most patients with advanced cancer, debilitating COPD or CHF live at home. In existing literature GPs asked for guidance in how to recognise patients in need of palliative care in a timely way and to structure anticipatory care. For that reason, we developed a training for GPs in identifying patients in need of palliative care and in structuring anticipatory palliative care planning and studied its effect on out-of-hours contacts, contacts with their own GP, hospitalisations and place of death.

We performed an RCT in which GPs in the intervention group were trained in identifying patients in need of palliative care and anticipatory palliative care planning. Next, for each identified patient, they were offered a coaching session with a specialist in palliative care to fine-tune a structured care plan. The GPs in the control group did not receive training or coaching, and were asked to provide care as usual. After one year, characteristics of patients who died of cancer, COPD or CHF in both study groups were compared with mixed effects models for out-of-hours contacts (primary outcome), contacts with their own GP, place of death and hospitalisations in the last months of their life (secondary outcomes). As a post-hoc analysis, of the identified patients (of the intervention GPs) these figures were compared to all other deceased patients, who had not been identified as in need of palliative care.

We did not find any differences between the intervention and control group. Yet, only half of the trained GPs (n=28) identified patients (n=52), which was only 24% of the deceased patients. Those identified patients had significantly more contacts with their own GP (B 4.5218; p 0.0006), were less often hospitalised (OR 0.485; p 0.0437) more often died at home (OR 2.126; p 0.0572) and less often died in the hospital (OR 0.380; p 0.0449). We

recommend future controlled studies that try to further increase identification of patients eligible for anticipatory palliative care.

In **chapter 5** we studied whether GPs, one year after being trained for the intervention condition of the RCT, identified more palliative patients and provided more often multidimensional and multidisciplinary palliative care compared to untrained GPs.

We performed a survey one year after the GPs in the intervention condition of the RCT received their training. With a questionnaire, all 134 participating GPs were asked how many palliative patients they had identified, and whether anticipatory palliative care was provided. We studied the number of identified palliative patients, expected lifetime, contact frequency, whether multidimensional care was provided and which other disciplines were involved. We found that trained GPs identified more palliative patients than untrained GPs (median 3 versus 2; p 0.046) and that they provided multidimensional palliative care more often (p 0.024). In both conditions, most identified patients had a diagnosis of cancer.

We conclude that RADPAC sensitises GPs in the identification of palliative patients. Trained GPs provided multidimensional palliative care more often. Further adaptation and evaluation of the tools and training is necessary to improve early palliative care for patients with organ failure.

In **chapter 6**, we described how GPs and consultants evaluated the different aspects of the training that the GPs in the intervention condition of the RCT followed, and its impact on their daily practice. GPs were trained to timely identify palliative patients with cancer, COPD or heart failure with the help of the RADboud indicators for PAlliative Care needs (RADPAC) and to make a proactive, structured care plan. They were offered two additional training sessions, in which they practiced with simulation patients, and for every individual patient, a consultation took place with a palliative care consultant to fine-tune the care plan. Two years after the training semi-structured interviews with the GPs were organised. Additionally, a focus group interview with the consultants took place after which the data were analysed with a thematic content analysis.

Six consultants and nine GPs participated. The majority of GPs mentioned positive changes in their thinking or acting regarding early palliative care. Part of them still used the tool to identify patients; most of the others reported that they had internalised the indicators. Although half of them still experienced discussing end-of-life aspects as difficult, particularly in patients with organ failure, others reported that they discussed the future with their palliative patients more easily.

Most GPs and consultants were positive about the training and applying it in daily practice. Nevertheless, we conclude that the timely identification of palliative patients with COPD or CHF, and the issue of discussing possible scenarios with patients, should have more attention in future training.

In **chapter 7**, the final chapter of this thesis, the main findings and strengths and weaknesses of the studies are discussed and placed in a wider perspective. This chapter ends with a more general societal discussion on the topic of this thesis "Early proactive palliative care in general practice: identification, communication, and structured planning".

Despite the negative outcome of the RCT, the post-hoc analysis indicates that the intervention has the potential to improve different aspects of the quality of palliative care in primary care. We discussed four possible reasons that might explain why GPs do not routinely practice proactive palliative care: 1. the concept of early identification; 2. the RAPDAC lack of connection to one of the pillars of general practice: the context of the patient; 3. the lack of awareness of the benefits of an early start of palliative care alongside disease modifying treatment among other health care professionals; 4. experienced barriers in discussing proactive palliative care with the patient and his family.

The main message of the general societal discussion is the importance of raising awareness all over society of what palliative care actually is.

SAMENVATTING

In **hoofdstuk 1** wordt de reden voor dit proefschrift 'Tijdige proactieve palliatieve zorg in de huisartspraktijk' (early proactive palliative care in general practice) beschreven. Al in 2002 stelde de Wereld gezondheidsorganisatie (WHO) dat palliatieve zorg in een vroege fase van ziekte beschikbaar moet zijn, naast de normale op ziekte gerichte zorg, voor alle patiënten die lijden aan kanker en andere levensbedreigende chronische ziekten.

In 2008, toen dit onderzoeksproject startte, bestond palliatieve zorg vooral uit terminale, reactieve zorg voor patiënten met kanker. In dit hoofdstuk wordt uitgelegd, waarom we sterk onze aandacht richten op het trainen van huisartsen in het vroeg identificeren van palliatieve patiënten en proactieve palliatieve zorgplanning. De huisarts fungeert als poortwachter en heeft meestal een langdurige relatie met de patiënt en zijn naasten. De huisarts lijkt de meest aangewezen professional om palliatieve zorg te coördineren voor patiënten met een gevorderd stadium van kanker, chronisch obstructieve longziekten (COPD) en hartfalen (CHF). Het gaat hierbij meestal om patiënten die thuis wonen en daar ook willen sterven.

In **hoofdstuk 2** wordt de ontwikkeling beschreven van een instrument voor huisartsen met als doel patiënten met kanker, COPD en CHF tijdig te identificeren, die baat kunnen hebben bij proactieve palliatieve zorg. Op het moment van starten van dit onderzoek in 2008 was er geen gevalideerd instrument voor het optimale moment van starten van palliatieve zorg. Voor de ontwikkeling van dit instrument gebruikten we een 3-stappen plan. Stap 1 was een literatuur review. Stap 2 behelsde meerdere focusgroep-interviews met input van professionals uit het multidisciplinaire palliatieve zorgveld. Stap 2 werd gevolgd door de laatste stap, een Rand Delphi procedure met huisartsen. Dit 3-stappen plan heeft geresulteerd in de RADboud indicators for Palliative Care needs (RADPAC), een instrument dat de huisarts kan ondersteunen in het vroeg identificeren van patiënten met kanker, COPD en CHF, die baat kunnen hebben bij proactieve palliatieve zorg.

Voor CHF zijn er 7 indicatoren gevonden, zoals bijvoorbeeld: meer dan 3 ziekenhuisopnames per jaar. Voor COPD vonden we 6 indicatoren, zoals bijvoorbeeld: Karnofsky score ≤50%. Voor kanker vonden we 8 indicatoren, zoals bijvoorbeeld: slechte prognose bij een primaire tumor.

De RADPAC is het eerste wetenschappelijk onderbouwde instrument voor een vroege identificatie van palliatieve patiënten, een instrument dat ontwikkeld is door middel van een combinatie van wetenschappelijk bewijs met ervaringen uit de praktijk. Het gebruik van de RADPAC vergemakkelijkt het starten van proactieve palliatieve zorg en beoogt de verbetering van palliatieve zorg in de huisartspraktijk.

Hoofdstuk 3 beschrijft het protocol van de gerandomiseerd gecontroleerde trial (RCT). Het vroeg identificeren van patiënten die baat kunnen hebben bij proactieve palliatieve zorg, draagt mogelijk bij aan een betere kwaliteit van leven. Tot de start van het onderzoek was deze denkwijze geen gemeengoed en in de wetenschappelijke literatuur werd er nauwelijks aandacht aan besteed. Palliatieve zorg werd veelal beperkt tot de terminale fase bij patiënten met kanker. Daarom wilden we huisartsen trainen in het vroeg identificeren van palliatieve patiënten en in het geven van proactieve palliatieve zorg. Het doel van de RCT was te bepalen of deze training verschillende aspecten van de kwaliteit van leven van patiënten met ernstige chronische ziekten, zoals kanker, COPD en CHF, kan verbeteren. We ontwierpen een twee-armige gerandomiseerde gecontroleerde trial. Als uitkomstmaten gebruikten we: plaats van overlijden, het aantal ziekenhuisopnames en het aantal avond-nacht-weekend (ANW) contacten met de huisarts. We verwachtten dat deze studie het aantal geïdentificeerde palliatieve patiënten zal vergroten en verschillende aspecten van de kwaliteit van palliatieve zorg zal verbeteren. Dit is van belang voor patiënten met COPD, CHF en kanker en hun naasten. Het versterkt bovendien de rol van de huisarts ten aanzien van palliatieve zorg.

Hoofdstuk 4 presenteert de resultaten van de in hoofdstuk 3 beschreven RCT. In de bestaande literatuur vragen huisartsen handvatten voor het tijdig herkennen van patiënten die baat kunnen hebben bij palliatieve zorg en handvatten voor proactieve palliatieve zorg. Om die reden ontwikkelden wij een training in het tijdig identificeren van palliatieve patiënten en in het structureren van proactieve palliatieve zorg en bestudeerden wij de invloed ervan op het aantal ANW-contacten, contacten met eigen huisarts, ziekenhuisopnames en plaats van overlijden. Huisartsen in de interventie groep werden getraind zowel in het tijdig identificeren van patiënten die baat konden hebben bij palliatieve zorg als in proactieve palliatieve zorg planning. Voor elke patiënt die zij identificeerden, werd hen een coaching sessie met een specialist in de palliatieve zorg aangeboden voor het preciezer uitwerken van het gestructureerd zorgplan. Huisartsen in de controlegroep kregen geen opleiding en coaching. Hen werd gevraagd om zorg te verlenen zoals gebruikelijk. Na één jaar werden kenmerken van patiënten die overleden waren aan kanker, COPD of CHF, in beide studiegroepen vergeleken door middel van mixed effect models voor ANW-contacten (primaire uitkomst), contacten met eigen huisarts, plaats van overlijden en ziekenhuisopnames in de laatste maanden van hun leven (secundaire resultaten). In een post-hoc analyse werden de geïdentificeerde patiënten van de interventie huisartsen vergeleken met alle andere, niet geïdentificeerde overleden patiënten.

We vonden geen verschil tussen de interventie groep en de controle groep. Slechts de helft van alle getrainde huisartsen (28) identificeerde patiënten (52), wat slechts 24% was van alle overleden patiënten. Deze geïdentificeerde patiënten hadden significant meer contacten met hun eigen huisarts (B 4.5218; p 0.0006), werden minder vaak in het ziekenhuis opgenomen

(OR 0.485; p 0.0437), overleden vaker thuis (OR 2.126; p 0.0572) en stierven minder vaak in het ziekenhuis (OR 0.380; p 0.0449). Meer onderzoek is nodig om tijdige identificatie van palliatieve patiënten die baat kunnen hebben bij palliatieve proactieve zorg te vergroten.

In **hoofdstuk 5** worden de resultaten beschreven van een studie waarin we onderzochten of huisartsen, een jaar na de interventie training, meer palliatieve patiënten identificeerden en vaker multidimensionele en multidisciplinaire zorg leverden dan de ongetrainde huisartsen.

Een jaar nadat de huisartsen in de interventie groep getraind waren, kregen alle 134 deelnemende huisartsen een vragenlijst. Daarin werd gevraagd hoeveel patiënten zij geïdentificeerd hadden en of er proactieve palliatieve zorg verleend was. We bestudeerden het aantal geïdentificeerde patiënten, de verwachte levensduur van de patiënten, de contactfrequentie, of de zorg multidimensioneel was en welke andere disciplines er betrokken waren.

De getrainde huisartsen bleken meer palliatieve patiënten geïdentificeerd te hebben dan de niet getrainde huisartsen (mediaan 3 versus 2; p 0.046). Ook bleken zij vaker multidimensionele palliatieve zorg te geven (p 0.024). In beide condities hadden de meeste geïdentificeerde patiënten een diagnose kanker.

We concludeerden dat de RADPAC huisartsen aanzet tot het identificeren van palliatieve patiënten. Getrainde huisartsen leveren meer multidimensionele palliatieve zorg. Verdere aanpassing en evaluatie van de RADPAC en aandacht voor multidimensionele palliatieve zorg zijn nodig voor de verbetering van proactieve palliatieve zorg voor patiënten met orgaan falen.

Hoofdstuk 6 beschrijft hoe huisartsen en consulenten palliatieve zorg, de verschillende aspecten van de training en de invloed op de dagelijkse praktijk ervaren hebben. Huisartsen in de interventie groep werden getraind in tijdige identificatie van palliatieve patiënten met kanker, COPD of CHF en proactieve palliatieve zorgplanning. Huisartsen in de interventie groep kregen twee terugkombijeenkomsten aangeboden, waarin men met simulatiepatiënten kon oefenen. Daarnaast konden huisartsen met een consulent palliatieve zorg, per geïdentificeerde patiënt, het gemaakte proactieve palliatieve zorg plan doorspreken en nader preciseren. Twee jaar na de training werden semigestructureerde interviews afgenomen bij huisartsen en focusgroep en interviews gehouden met consulenten palliatieve zorg. Een kwalitatieve inhoudsanalyse van de verzamelde data werd verricht.

Zes consulenten en negen huisartsen namen deel aan de interviews. De meeste huisartsen vermeldden een positieve verandering in hun manier van denken en handelen ten aanzien

van vroege proactieve palliatieve zorg. Een deel van de huisartsen gebruikte de RADPAC nog, de meesten gaven aan zich deze indicatoren eigen gemaakt te hebben. Ongeveer de helft van de huisartsen vindt de gesprekken over het levenseinde moeilijk, vooral bij patiënten met orgaan falen. De overige huisartsen gaven aan na de training wat gemakkelijker dit gesprek aan te gaan.

Ondanks dat de meeste huisartsen en consulenten positief waren over de training en toepassen in de dagelijkse praktijk, is er meer aandacht nodig in toekomstige onderzoeksprogramma's voor vroegtijdige identificatie van voornamelijk palliatieve patiënten met COPD en CHF en voor het bespreken van hun toekomst.

In het laatste hoofdstuk van dit proefschrift, **hoofdstuk 7**, worden ten eerste de belangrijkste bevindingen en de sterke en zwakke punten van de verschillende onderzoeken bediscussieerd en in een breder perspectief beschouwd.

Ondanks de negatieve uitkomst van de RCT, lijkt de post-hoc analyse te wijzen op een mogelijk positief effect van de interventie op verschillende aspecten van palliatieve zorg in de eerste lijn. We bediscussiëren vier mogelijke verklaringen waarom het voor huisartsen moeilijk is routinematig proactieve palliatieve zorg te verlenen.

1. Het concept vroeg identificatie van palliatieve patiënten.
2. De RADPAC heeft geen aspecten ten aanzien van een van de pijlers van de huisartsgeneeskunde, namelijk, de context van de patiënt.
3. Het gebrek aan bewustzijn van de voordelen van het vroeg starten met proactieve palliatieve zorg, naast de op ziekte gerichte behandeling onder de verschillende professionals in de gezondheidszorg.
4. De ervaren grenzen in het bespreken van proactieve palliatieve zorg met patiënten en hun naasten.

Ten tweede worden enkele algemene maatschappelijke discussiepunten ten aanzien van palliatieve zorg besproken. De belangrijkste boodschap van de algemene maatschappelijke discussie is de noodzaak tot bewustwording van wat palliatieve zorg is, in alle lagen van de maatschappij.

DANKWOORD

Promoveren doe je niet alleen!

Daarom wil ik iedereen die bijgedragen heeft aan mijn onderzoek en proefschrift ontzettend bedanken.

Allereerst wil ik mijn copromotoren en promotoren bedanken.

Yvonne, ik wil je bedanken voor je onovertroffen begeleiding op velerlei vlak en je vertrouwen in mij. Ik ben heel blij dat je mij, in overleg met Marieke, Stans en Kris, hebt benaderd nog eens na te denken over 'toch promoveren'. Dat heb ik gedaan, zie hier het resultaat! Ik heb geboft met jou als copromotor! Trouwens, de filmtips mochten er ook wezen. Marieke, we begonnen als duo aan dit onderzoek; sparringsmaatjes op 'de Buitenhoek' en niet alleen over serieuze onderzoekszaken. Ik heb ontzettend veel van je geleerd. Ik wil je bedanken voor je bemoedigende woorden als ik niet meer wist hoe het allemaal voor elkaar te krijgen. Oneindig veel kopjes koffie hebben we gedronken en gelachen om onze 'palliatievehandenfoto'-muur.

Kris Vissers, bedankt voor de steun en het vertrouwen dat je me de afgelopen jaren gegeven hebt. De weg is niet zonder hobbels geweest, maar ik weet inmiddels dat dit voor promoveren eigenlijk heel normaal is...

Chris van Weel, voor mijn gevoel ken ik je al sinds ik mijn eerste stappen in de prekliniek zette. Ik wil je bedanken voor je vertrouwen, de inbreng vanuit je huisartsgeneeskundigehelikopter visie en voor je opbouwende feedback.

Stans Verhagen, vanaf het begin ben je intensief bij het onderzoek betrokken geweest. Bedankt dat ik gebruik heb mogen maken van je immens uitgebreide kennis.

Alle deelnemende huisartsen, hun assistentes, de geïncludeerde patiënten en hun naasten wil ik bedanken. Zonder hen zou dit onderzoek niet hebben kunnen slagen, en er zelfs helemaal niet zijn geweest. Mijn drijfveer om een bijdrage te leven aan de dagelijkse huisartspraktijk, ligt hierin besloten.

Voor het verzamelen van de data wil ik de volgende onderzoeksassistenten en stagiaires bedanken: Naomi Reitsma, Irene Loman, Bram Lestrade, Annelies van Bruggen, Aletta Moelands, Paul Konings, Stefanie Gerritzen en Sanne Heijmans.

Cora Leijdens en Marjo van Bommel, bedankt voor het enthousiasme waarmee jullie de trainingen hebben gegeven.

Mijn collega's, aanvankelijk op 'de Buitenhoek', daarna 'De omloop' en nu op de 4de: Franca, Kathrin, Jeroen H., Jelle, Patrick, Kalinka, Nasira, Annette, Hans, Jasper, Anne, Marlieke, Ria, Marianne, Tijn en Jackie (hopelijk vergeet ik niemand), bedankt voor de gezelligheid en alle bemoedigende woorden. Franca, ik wil je bedanken voor je vriendschap. We bespraken naast onderzoeksperikelen, ook huisartsvak- en privéperikelen. Ben benieuwd welke vraag je gaat stellen! Jelle (Julle), op je vraag 'En, wanneer ga je promoveren?' weet ik eindelijk het antwoord!

Jeroen F., een woord voor jou: Collega van de buitenhoek, mijn oudste gepensioneerde vriend. Ik wil je hier bedanken, voor je vriendschap, je creativiteit en je humor. Snel weer een wijntje bij Frowijn?

Eric, ook jou ben ik dank verschuldigd. Je maakte in de eerste jaren van het onderzoek deel uit van de directe begeleiding van mijn onderzoek en promotie. Je input als huisarts en onderzoeker waren van grote waarde. Niet alleen voor het onderzoek, ook voor mij als persoon.

Een speciale plek voor de 'Ottenhoff'. Jaap, ik wil je bedanken voor je vertrouwen. Ik heb onze overlegmomenten als verrijkend ervaren. Ik vind het inspirerend, hoe je naast patiëntenzorg de praktijk runt en dit weet te combineren met eigen initiatieven om 'palliatieve zorg in de eerste lijn' te verrijken.

Mo, Henny, Brigit, Patty, Jan, zonder jullie is er geen praktijk 'Ottenhoff'. Bedankt!

Mijn familie en vrienden, jullie zijn onmisbaar in mijn leven. Bedankt voor de onvoorwaardelijke steun en vriendschap! Hysfijne vrienden, wat ben ik ontzettend blij met jullie! Onze twee jaarlijkse 'decadente' vakanties zijn ongeëvenaard en de slagroom op onze vriendschap! 'Super-visie' vriendinnen, hoe fantastisch dat wij elkaar hebben leren kennen! Dames van het VWO, bedankt voor onze jarenlange vriendschap. Ik durf bijna niet uit te rekenen, hoe lang dat al is.

Ieke, Sami, Floortje, Isa en Roos, jullie wil ik bedanken dat ik deel uit mag maken van jullie gezin. Ontzettend bedankt voor de lieve woorden en de fijne knuffels. Ieke, ik wil je bedanken voor je vertrouwen, je vermogen om andere vragen te stellen en je vriendschap. Wat ontzettend fijn dat je mijn paranimf wilt zijn!

Irene, wat geniet ik ontzettend van onze vriendschap en vakantieavonturen! Bedankt dat ook jij mijn paranimf wilt zijn!

Lieve Pap en Mam, Lieve Anne en Nynke, Lieve Mark en Floris en Lieve Mats, Jens, Mia, Mare en Wout. Ik kan niet vertellen hoeveel jullie voor me betekenen. Bedankt voor al jullie steun en liefde!

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CURRICULUM VITAE

Bregje Thoonsen was born in Nijmegen, the Netherlands, on September 24, 1972. After graduating secondary school (Canisius mavo, Nijmeegse Scholen Gemeenschap 1993), she studied Biomedical Health Sciences (Radboud University). In 1998 she finished her study with a specialisation in epidemiology. In 1999 Bregje entered medical school and obtained her medical degree in 2003. Between 2003 and 2005 she worked as a physician in different departments in a hospital in Zevenaar and in a nursing home in Zwolle. From 2005 until 2007 she did her general practice residency training at the Radboud university medical center in Nijmegen, with special interest in palliative care. During her internship in Dove House Hospice (Hull, United Kingdom) her interest in palliative care became more evident than before. She started a PhD research at the department of Anaesthesiology, Pain and Palliative Medicine of Radboud university medical center.

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